AMERICAN AUGERS®
an Astec Company

es!lok® Exit Side Lockout System Operation & Safety Instruction Manual

es!lok®

Exit Side Lockout System

Lockout-Tagout Protection for Trenchless Operations

NOTICE

The es!lok® system provides a way to perform “lockout-tagout” from a remote location, such as the exit side of a directional bore. The es!lok® system is not intended to replace other customary safety procedures, and is not intended to substitute for clear communication between the exit side crew and the machine operator.

The es!lok® is not intended for use as an emergency shutdown device.

es!lok is a registered trademark of American Augers, Inc.
All other trademarks are owned by their respective companies.

Entire contents copyright © 1998, 2000, 2010, 2011, 2012

Original Instructions
Manual Part Number 6ER30000
Released April 2012 Revision 04

Table of Contents

Overview 7

Potential Hazard - Need for the es!lok® System 7
Lockout-Tagout 7
Fail-to-Safe Design 7
es!lok System Overview 8
Operating Range - Short Bores 8
Operating Range - Long Bores 9
Frequency and Addressing 10
Flexible Installation 10
On the Job Durability 11

Components 12

System Components 12
System Configurations 14
Technical Specifications 15

Set Up and Operation 16

Mounting and Connecting the Drill Side Receiver to a Drill Rig 16
Mounting Exit Side Receiver and Power Transmitter on the Exit Side of the Job 17
Preparing the es!lok Transmitter 17
Operating Procedures 18
Portable Power Source included with System A-B 20

Troubleshooting 21

Troubleshooting the es!lok System 21
Quick Reference Guide 22

Parts Lists 29

es!lok Parts List 29
Drill Side Receiver Assembly Component Parts (6ER30010) 30
Exit Side Receiver Assembly Component Parts (6ER30020) 31
es!lok Transmitter Assembly Component Parts (6ER30030) 32
Receiver Service Parts; 434 MHz and 458 MHz 33

Appendix A: Booster Pac User's Manual 35

Notes

NOTES:

Revision Record

Revision to Manual

Revision Number	Description of Change	Date
00	New release	12/14/2010
01	Updated drawing 6ER30010B	1/10/2011
02	Updated parts list for Exit Side Receiver Assembly (6ER30020)	1/18/2011
03	Updated connection procedure (p. 16) and drawings 6ER30010 and 6ER30020	2/28/2011
04	Part 8EP01109-5 recalled by manufacturer and replaced with 8EP01109-6; Part 8EP01109-5-1 no longer required; parts list and drawings 6ER30020 and 6ER30021 updated	4/23/2012

System Information

Customer Name	
Country	
Frequency (circle one)	434MHZ - 458 MHZ - _____
es!lok System Part Number (circle one)	
6ER30001	es!lok System; 600 Foot; 434MHz
6ER30002	es!lok System; 600 Foot; 458MHz
6ER30003	es!lok System; 1 Mile; 434MHz
6ER30004	es!lok System; 1 Mile; 458MHz
6ER30005	es!lok System; 2 Mile; 434MHz
6ER30006	es!lok System; 2 Mile; 458MHz
6ER30007	es!lok System; 3 Mile; 434MHz
6ER30008	es!lok System; 3 Mile; 458MHz
Binary Code Address (ADMO Serial Number)	
Drill Side (A-Side)	ADMO Serial # ...Fill in All 4
A1	
A2	
A3	
A4	
Exit Side (B-Side)	ADMO Serial # ...Fill in All 4 (if applicable)
B1	
B2	
B3	
B4	
Exit Side (C-Side)	ADMO Serial # ...Fill in All 4 (if applicable)
C1	
C2	
C3	
C4	
Exit Side (D-Side)	ADMO Serial # ...Fill in All 4 (if applicable)
D1	
D2	
D3	
D4	

Overview

Potential Hazard - Need for the es!lok® System

Do not attempt to bypass the es!lok® system. Operation of the drill with the es!lok® disabled can result in injury or death.

Entanglement hazard. Rotating shaft can crush body parts or kill you. Keep body parts and clothing away.

Whether you're drilling a few hundred feet or a mile, the exit side crew has to work close to the pipe and tooling. This creates a potential hazard to crew members. On long bores the driller may not even be able to see the exit side crew. Miscommunication or loss of 2-way radio communication between the drill operator and the exit side crew can lead to unexpected movement or rotation of the drill pipe and tooling.

Lockout-Tagout

Government regulations and safety procedures in factories, refineries, rock crushing plants and others require "lockout-tagout" before any adjustment or maintenance is done on equipment. For electrically-powered equipment, repair crews turn off the power supply, lock it in the OFF position (lockout) and apply a sign that says, "Do Not Operate" (tagout). For trenchless construction equipment, the crew on the exit side needs a way to lockout the drill so they can work directly on the pipe string or exit side tooling.

The es!lok system is a lockout system. Its function is to allow a worker who must work in proximity to the drill pipe at the Exit Side to be able to "lockout" the movement of the pipe. The es!lok system is not intended to replace other customary safety procedures and is not intended to substitute for clear communication between the exit side crew and the machine operator. It is not intended for use as an emergency shutdown device.

Fail-to-Safe Design

The es!lok system is designed as a "Fail-to-Safe" system. This means that the system will go into lockout if any component fails. All es!lok Transmitters and Power Transmitters MUST be in proper working order with a charged battery and in constant communications with their respective receivers. The system will go into Fault and the associated machine will stop operating if:

- the battery is not charged
- the es!lok Transmitter is not turned on (reset)
- the es!lok Transmitter is out of range
- communication between the es!lok Transmitter or Power Transmitter and the receiver is interrupted

This Fail-to-Safe design ensures that when a worker engages the es!lok Transmitter, the machinery will indeed be locked out. In the event of an unplanned lockout, LEDs on the side of the Receiver indicate the status of the system for quick correction.

es!lok System Overview

Improper installation of es!lok could cause injury or death.

- When es!lok is installed on a machine not manufactured by American Augers, test the system for proper lockout of selected functions. Selected functions should not operate unless the es!lok transmitter is ON and the receiver is Reset.

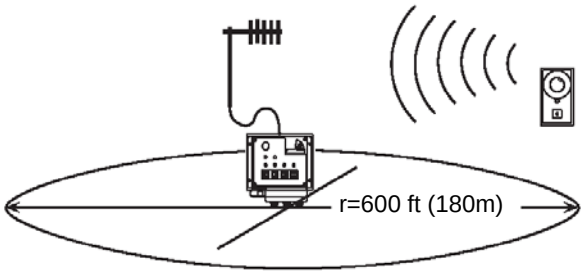
The es!lok system includes the es!lok Transmitter which is hand-held or worn on a belt like a pager. It is effective within a 600 foot (180 meter) radius of the receiver. When the es!lok system is activated by the Competent Person on the crew, it sends a signal to a receiver connected to the drill. An “Enable” light on the receiver indicates when the transmitter is successfully communicating with the receiver. Circuits between the receiver and the drill controls allow the drill to operate normally.

When communication between the transmitter and receiver is lost, for example when the Transmitter’s Stop button is pushed, drill functions stop. Special circuits disable, i.e., “lockout”, the pipe rotary and thrust while leaving the engine running so other circuits are unaffected. This acts as the tag which would be affixed to an electric power supply. Once the system has been locked out, it stays locked until the Competent Person on the exit side resets the transmitter and the driller manually resets (“unlocks”) the receiver.

Note that at least one es!lok (hand held) transmitter must be turned on and functioning for the drill to operate. If you are using a Long Range system with a Drill Side and an Exit Side, at least one exit side es!lok transmitter should be on and the power transmitter must be communicating with the drill side receiver to allow the drill to operate.

Operating Range - Short Bores

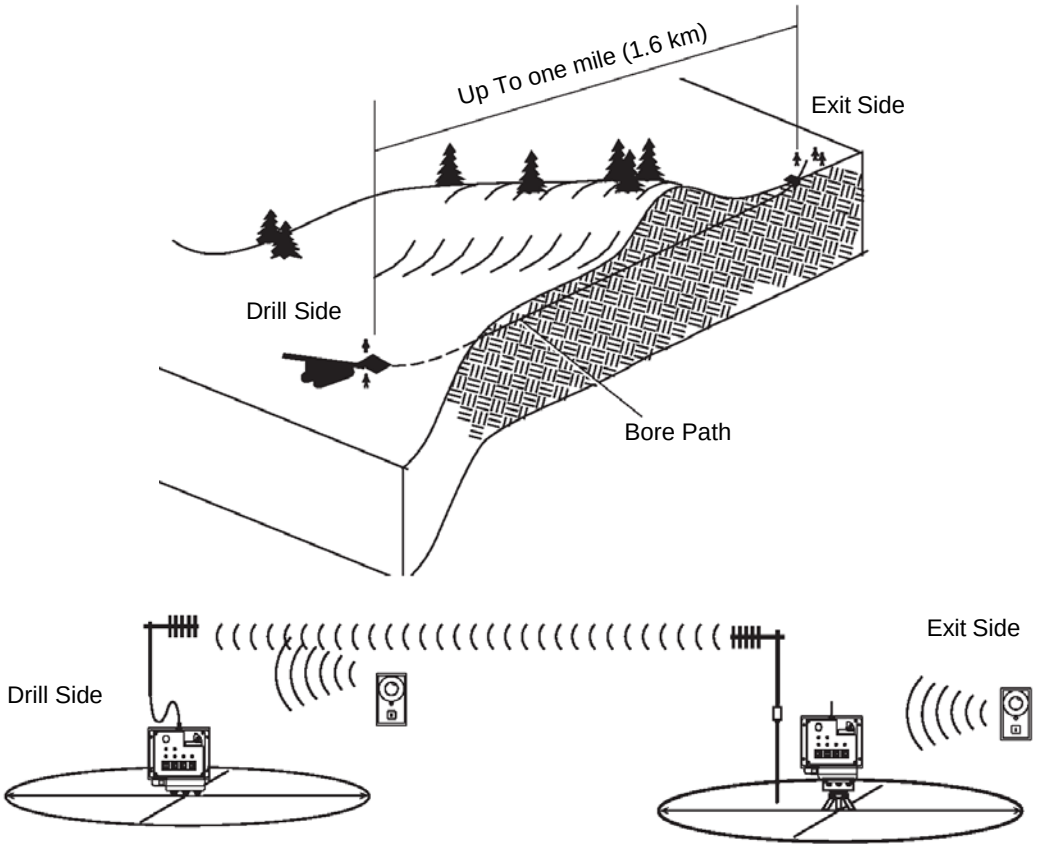
For short bores, a system with es!lok Transmitters and a receiver, shown in the drawing below, may be sufficient. This system, System A, has an operating radius of 600 feet (180 m).



Overview

Operating Range - Long Bores

To attain a range of one mile (1.6 km), the es!lok Transmitter is supplemented by a receiver and Power Transmitter which is placed at the exit side. This is called System A-B. Each side has an operating range of 600 ft (180 m). A 12-volt Booster Pack provides power to the Exit Side Receiver and the Power Transmitter. Additional Exit Side Transmitters, Receivers and Power Transmitters can be used to obtain systems capable of 2 to 3 mile (3.2 to 4.8 km) communication. The drawing below shows the configuration of equipment used for a longer bore.



Frequency and Addressing

The es!lok system is designed to be used as a lockout system without unnecessary work shutdowns due to nuisance tripping. To this end, each es!lok Transmitter, Receiver and Power Transmitter contains a registration-free radio frequency unit. Each Transmitter has a defined frequency and a unique Address Code that is matched with one of the 4 switchable channels on the receiver.

- ***All es!lok systems sold by American Augers are factory set with unique frequency and address codes.***
- ***Customers' names, sales order numbers and sales dates are recorded at American Augers.***
- ***The customer should never have to adjust the frequency or address codes.***

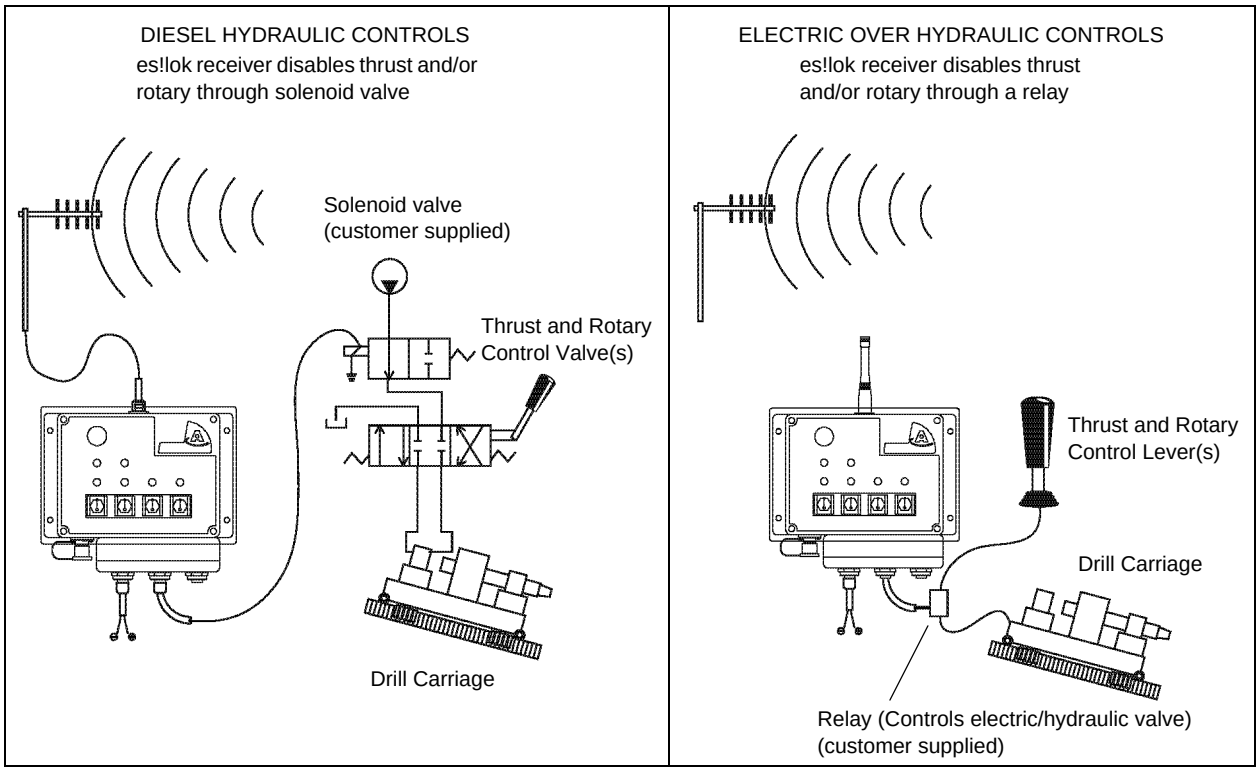
The receiver unit is capable of receiving one of several discrete frequency channels. Typically, 2 transmitters are supplied with each receiver matched with the first and second channel. If interference occurs on 1 transmitter frequency, the other transmitter/channel can be used. If there are multiple systems operating in the same vicinity, be sure the system frequencies are set 2 to 3 channels apart. Contact American Augers factory for assistance in changing system frequencies.

In case of loss or damage to any components of an es!lok system, contact American Augers for a replacement with the frequency and address codes set when you received the unit. Please have the component serial number or the serial numbers of the mating components ready when you call the factory. This will help us properly identify your es!lok system. See page 6 for a place where you can record your systems' information.

Flexible Installation

The es!lok system can control any system that has an electric circuit, or where an electric circuit can be added. Hydraulic or pneumatic systems can be controlled by adding an electric solenoid valve. Installation can be done by a competent electrician. The system can be retro-fitted to older drills. The drawing below shows these two methods of operation.

Overview


DIESEL HYDRAULIC CONTROLS
es!lok receiver disables thrust and/or rotary through solenoid valve
Solenoid valve (customer supplied)
Thrust and Rotary Control Valve(s)
Drill Carriage
ELECTRIC OVER HYDRAULIC CONTROLS
es!lok receiver disables thrust and/or rotary through a relay
Thrust and Rotary Control Lever(s)
Drill Carriage
Relay (Controls electric/hydraulic valve) (customer supplied)

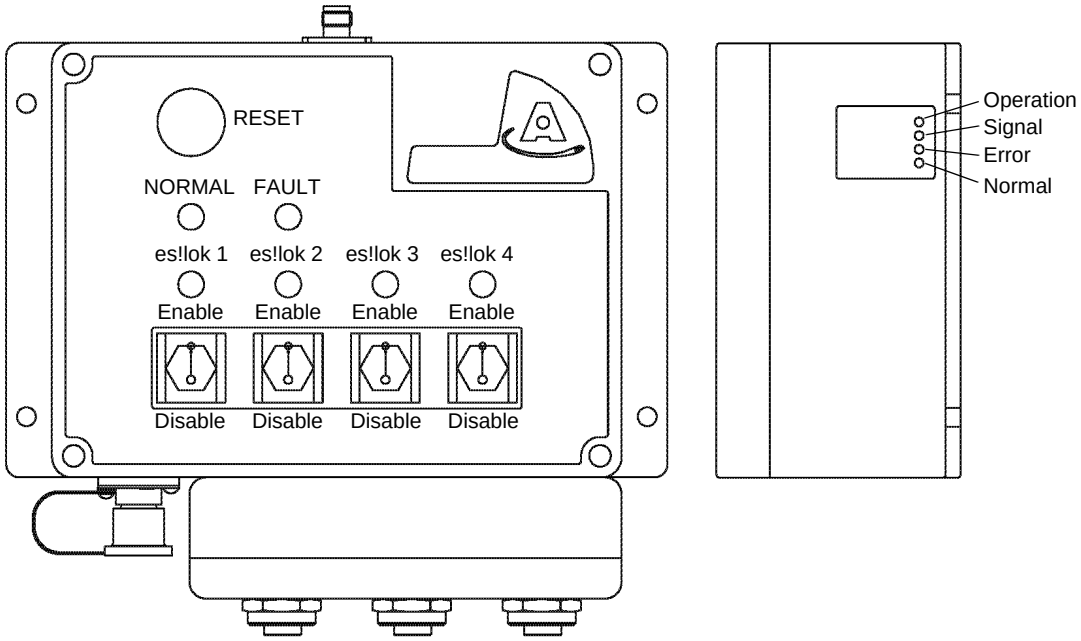
On the Job Durability

All es!lok system components are designed to be used outdoors. The es!lok transmitters have impact resistant, weather-resistant resin cases. The receivers are housed in weather-resistant enclosures.

System Components

Drill Side Receiver

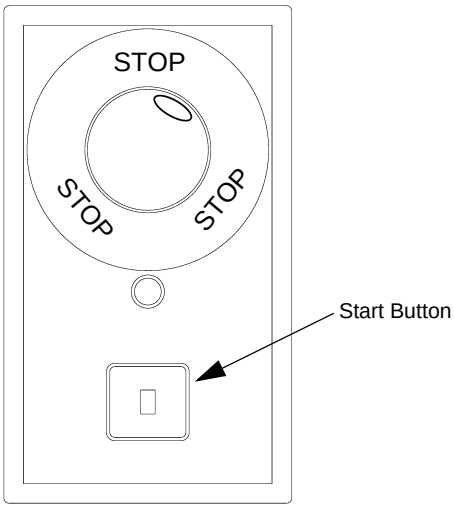
It is mounted to the drill and may be equipped with a long range antenna.
Synonyms: Receiver, A-Side Receiver



es!lok Transmitter

A hand-held unit that can be worn on a belt like a pager. Transmitters are used on the Drill Side and the Exit Side.

Synonyms: Transmitter, Hand-Held Transmitter, Belt Unit, Belt Mounted Transmitter

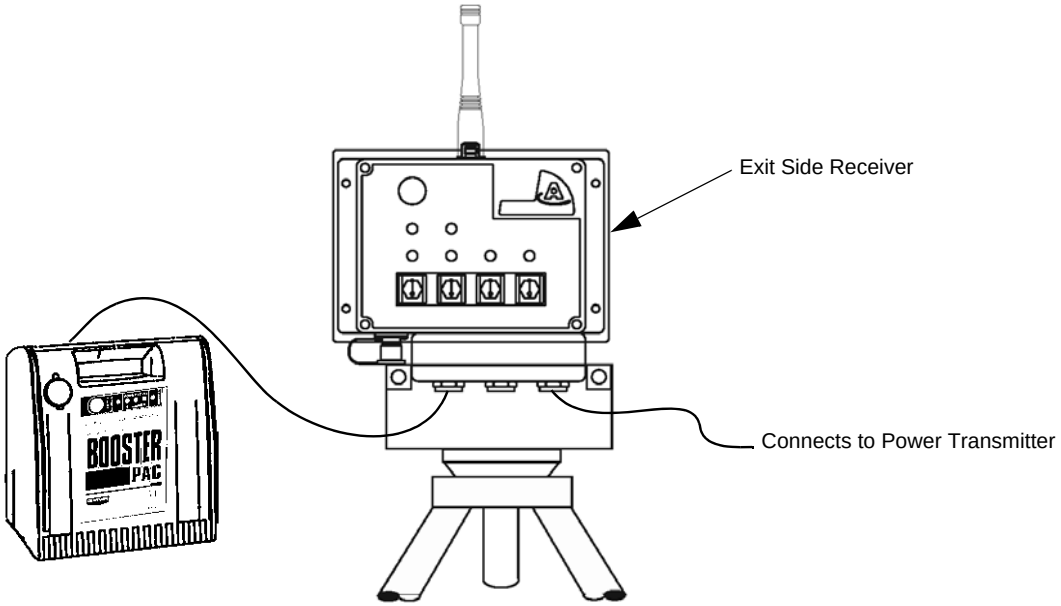


Components

Exit Side Receiver

Equipped with a standard range antenna and mounted on a tripod; Front and side identical in appearance to the Drill Side Receiver. May be plugged into a Battery Booster Pac.

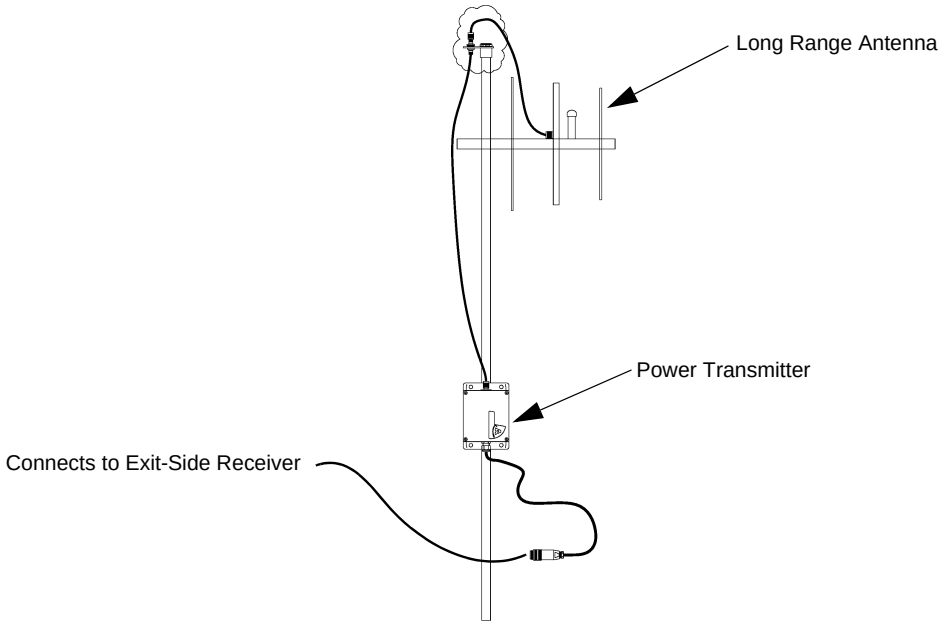
Synonyms: Transceiver, B-Side Receiver



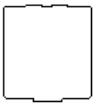
Power Transmitter

Mounted on a pole; may be equipped with an additional long range antenna for longer bores or if line of sight to the drill is obstructed

Synonyms: Exit Side Power Transmitter, B-Side Power Transmitter

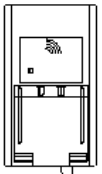


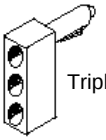
Additional Equipment



NI-MH battery
for transmitter

Battery for trans-
mitter; uses 3 AA
cells



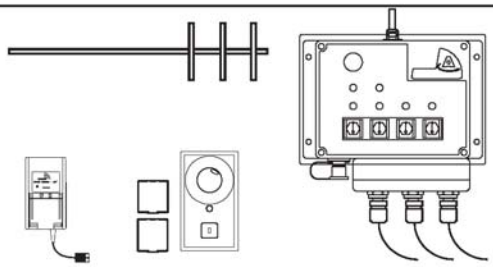


Triple Socket

Charger for batteries
(DC standard; AC available)

Portable Power Source
for Exit Side Receiver

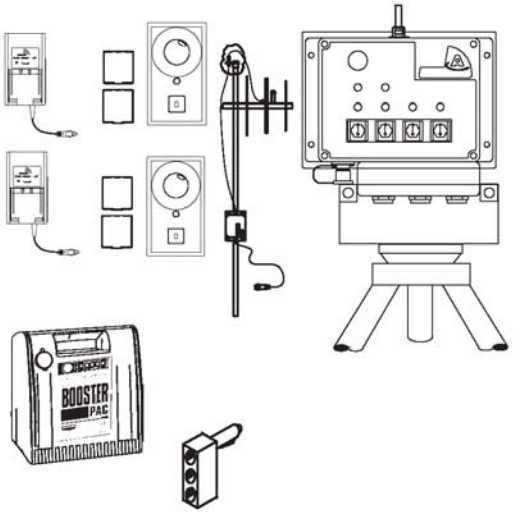
System Configurations



System A includes;

- One machine-mounted receiver and long range antenna
- Two es!lok Transmitters
- Four batteries and two chargers
- Standard range antenna

Operating range: 600 ft (180 m) from receiver



System A-B includes;

- System A, plus:
- One Exit Side Receiver with tripod and Power Transmitter
- Two es!lok Transmitters, 4 batteries and two chargers
- Portable Power source

Operating range: one mile (1.6 km) from drill rig

Additional system can be used to provide a
2-3 mile range

Components

Technical Specifications

Frequency.....434 MHz [1]
Operating range.....180 m (600 ft); Transmitter to Receiver
Operating range.....1.6 km (1 mile); Power Transmitter to Receiver
Radiated power .....Transmitter: 13 mW
Radiated power .....Power Transmitter: 100 mW
Operating temperature .....-25°C to 70°C (-18°F to 158°F)
Addressing.....up to 1,000,000 addresses available
Input voltage.....12/24 Volts DC
es!lok transmitter batteries .....3.6v 1200 mAh Ni-MH
es!lok transmitter batteries .....AA battery pack; holds 3-AA batteries
Nominal battery life.....16 hours
Nominal recharging time.....4 hours
Battery charger.....12/24v DC supplied; 115/230v 50/60 Hz AC optional
Portable power source.....Booster pack; 12 Volts DC for exit side System B

Receivers are capable of closing a normally open (N.O.) circuit or opening a normally closed (N.C.) circuit.

Additional components are available to extend operating range or to equip additional crew members with hand-held es!lok transmitters

Available accessories:

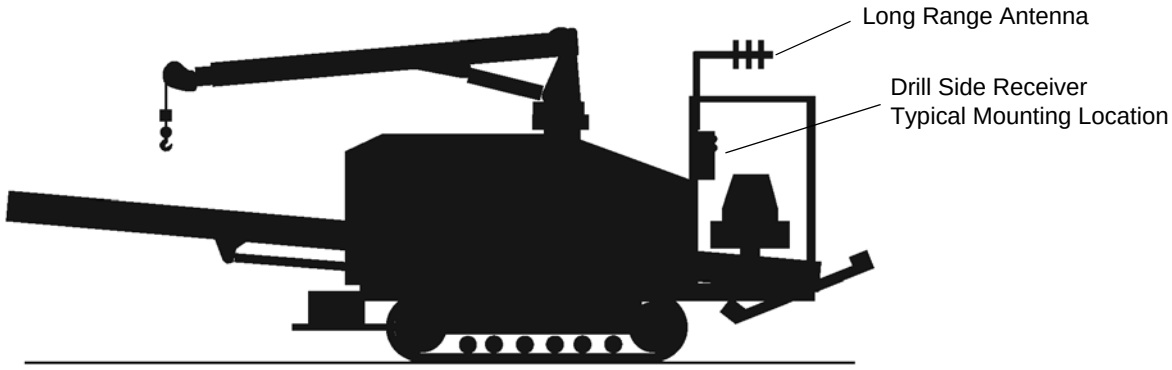
- Spare es!lok transmitter with 2 batteries and charger includes:
  - Spare es!lok transmitter (available separately)
  - Spare transmitter batteries (available separately)
  - Transmitter battery charger for 12/24 VDC (available separately)
- Battery charger for 115/230 VAC, 50/60 Hz
- Miniflex TNC antenna
- Long range antenna
- Antenna cable
- Fuses, connectors, switches, etc.

1. *Canada, Mexico, India, Puerto Rico and Hong Kong require 458 MHz. American Augers provides systems at 458 MHz for these countries.*

Mounting and Connecting the Drill Side Receiver to a Drill Rig

IMPORTANT:
- Do not operate the system without the antenna attached. Transmitter will be damaged.

1. Mount the Drill Side Receiver to the machine at a location near the machine operator. Attach using the vibration mounts and screws provided.
2. Use the Standard Range Antenna (8ER10013TNC) when the Transmitter is less than 600 feet (180 m) from the Drill Side Receiver. The Long Range Antenna is required only at distances greater than 600 feet (180 m) or when experiencing loss of signal due to interference.
3. To mount the Long Range Antenna (6ER00021), use the provided mounting tube and clamps. Mounting clamps can be bolted or welded to the Drill Rig. The Long Range Antenna should be mounted as high as possible (8-10 ft (2.4-3 m)) above ground level. The antenna should be mounted vertically and pointing in the direction of the bore.
4. Connect power (12 or 24 Volts DC) to the Drill Side Receiver using the provided connector (2 socket connector). The 12 or 24 Volt power source should be fused to 10 amps.
   - Connect the provided plug (3 socket connector) to the machine's shut down circuit. Use the Brown and Grn/Yel. wires if connecting to an energized-to-run system.
   - Use the Blue and Grn/Yel. wires if connecting to a de-energized-to-run system.
5. The customer has the option of what functions to "shutdown". It is recommended that the functional moving components be shut down (i.e. Rotary and Thrust). It may be necessary to shut down all functions (i.e. stop the engine). However, consideration should be given to the fact that the engine would have to be restarted quickly to move the functional components if required.



Set Up and Operation

Mounting Exit Side Receiver and Power Transmitter on the Exit Side of the Job

IMPORTANT:
- Do not operate the system without the antenna attached. Transmitter will be damaged.

1. Mount the Exit Side Receiver on the provided tripod. Locate the Receiver near the exit side pit.
2. Mount the Power Transmitter using the provided mounting tubes and stake. Verify that the antenna is attached.

   The Power Transmitter should be mounted the maximum distance possible from the Receiver and as high as possible. This will provide the best “line of sight” path back to the Drill Side Receiver. Connect the Power Transmitter to the Exit Side Receiver using the provided cable and connector (5-pin connector).

3. Connect the Portable Power Source (12 Volts DC) to the Exit Side Receiver using the provided cable (6ER30020A). A triple socket adapter (8EO24108) is provided so that the Exit Side Receiver and two battery chargers for the hand-held es!lok Transmitters can be connected at the same time.

4. Connect the Power Transmitter to the Exit Side Receiver with the attached cable.

Preparing the es!lok Transmitter

1. The es!lok Transmitter is delivered in ready to go condition. Simply install a charged battery and put the es!lok on your belt.
2. The es!lok Transmitter batteries are rechargeable batteries with an operating time of up to 16 hours. Each es!lok Transmitter Kit includes 2 batteries and 1 battery charger (12 Volts DC Input).
3. A holder (8ER10033) for 3 AA batteries is also provided with each transmitter assembly. It can be used if the rechargeable battery was not charged. It also has an operating time of 16 hours.

   The battery charger comes with a connector (8EO24111) that will plug into the provided Portable Power Source if the charger is used with the Exit Side es!lok Transmitters. The customer may choose to hard wire the charger(s) to 12 Volts DC directly at the machine. When the battery is fully recharged the green light will blink indicating that the charger is monitoring the condition of the battery and maintaining a full charge indefinitely. POLARITY MATCHING IS NOT REQUIRED.

4. If you are unsure of the battery condition, place the battery into the charger. A fully charged battery will cause the green charger light to blink after about 10 minutes. 115 - 230 VOLT AC battery chargers (part number 8ER10011-5) are available from the factory.

Operating Procedures

1. Activate an es!lok Transmitter
   - Turn one of the Enable-Disable switches on the receiver to the Enable position
   - Activate the matching es!lok Transmitter by pressing the green Start Button. For example:
     - Drill Side Receiver Enable/Disable Switch 1 matches es!lok Transmitter A-1
     - Exit Side Receiver Enable/Disable Switch 2 matches es!lok Transmitter B-2
     - Note: Drill Side Receiver Enable/Disable Switch 4 is reserved for the Exit Side Power Transmitter
2. (Machine Operator) Reset the system by momentarily pushing the Reset Button located on the Drill Side Receiver. The Reset Button on the Exit Side Receiver does not have to be reset to allow the machine to operate. (The Reset Button on the Exit Side would only affect something connected to the 3-pin output connector on the Exit Side Receiver. Other than special circumstances, there is nothing connected to the Exit Side Receiver output.) The Exit Side Receiver resets automatically to energize the Power Transmitter (1-mile systems).

   Note that the es!lok system is not a replacement for Standard Radio Communication between the machine operator and exit side personnel. When a worker with an es!lok Transmitter is going to lock out the machine, he should communicate his intentions to the machine operator.

3. When the worker resets his es!lok Transmitter he MUST communicate with the machine operator so the machine can be reset with the Drill Side Receiver's Reset Button.

Example 1 - Short Bore: Customer owns an es!lok 600 ft range system (Part number 6ER00001 or 6ER30002) with a Drill Side Receiver and one to four es!lok Drill Side Transmitters. Each es!lok Transmitter has its own frequency and a unique serial number. The digits of the serial number represent the transmitter's binary code address. Each es!lok Enable/Disable switch on the Drill Side Receiver is programmed to receive the signal from one of the es!lok Drill Side Transmitters. The table below shows a typical set up:

es!lok Transmitter	Binary Code Address	Enable/Disable Switch
A-Side #1	123451	A-Side Receiver es!lok1
A-Side #2	123452	A-Side Receiver es!lok2
A-Side #3	123453	A-Side Receiver es!lok3
A-Side #4	123454	A-Side Receiver es!lok4

At least one es!lok Transmitter must be turned on and the Drill Side Receiver's corresponding Enable Switch must be turned to "Enable". When communication is established, the green light above the enable switch turns on and the Drill Side Receiver can be reset. When the Reset button is pushed, the fault light (red) goes out and the normal light (green) goes on. Drilling operations are enabled.

Set Up and Operation

Example 2 - Long Bore: Customer owns an es!lok 1-mile range system (Part number 6ER30003 or 6ER30004). Each es!lok Transmitter has its own frequency and a unique serial number. The digits of the serial number represent the transmitter's binary code address.

- Enable/Disable switches 1-3 on the Drill Side Receiver are programmed to receive the signal from one of the es!lok Drill Side Transmitters.
- Enable/Disable Switch #4 is reserved for the binary code address of the Exit Side Power Transmitter. Exit Side Transmitters communicate with the Drill Side Receiver via the Exit Side Power Transmitter.

Typical Drill Side Receiver Set Up

es!lok Transmitter	Binary Code Address	Enable/Disable Switch
A-Side #1	123451	A-Side Receiver es!lok1
A-Side #2	123452	A-Side Receiver es!lok2
A-Side #3	123453	A-Side Receiver es!lok3
Exit Side Power Transmitter	123454	A-Side Receiver es!lok4

The Drill Side Receiver is programmed to receive the signal from each of the es!lok Drill Side Transmitters. At least one of the es!lok Transmitters must be turned on and the Drill Side Receiver's appropriate Enable Switch must be turned to "Enable". When communication is established, the green light above the enable switch turns on and the Drill Side Receiver can be reset. When the Reset button is pushed, the fault light (red) goes out and the normal light (green) goes on. Drilling operations are enabled.

Typical Exit Side Receiver Set Up

es!lok Transmitter	Binary Code Address	Enable/Disable Switch
B-Side #1	123455	B-Side Receiver es!lok1
B-Side #2	123456	B-Side Receiver es!lok2
B-Side #3	123457	B-Side Receiver es!lok3
B-Side #4	123458	B-Side Receiver es!lok4

The Exit Side Receiver is programmed to receive the signal from each of the es!lok Exit Side Transmitters. At least one of the es!lok Transmitters must be turned on and the Exit Side Receiver's appropriate Enable Switch must be turned to "Enable". When communication is established, the green light above the enable switch turns on and the Exit Side Receiver can be reset. The fault light (red) goes out and the normal light (green) goes on.

When at least one of the es!lok Exit Side Transmitters and its appropriate Enable Switch are turned on and communicating, the Exit Side Power Transmitter is enabled and will transmit a signal back to the Drill Side Receiver on enable switch #4. It is not necessary for the Exit Side Receiver to be "Reset" for the Power Transmitter to be "On" and sending a signal back to the Drill Side Receiver.

Once 1 or more es!lok Transmitters have established communication with the Exit Side Receiver, the associated Enable/Disable switch will have no effect on the Power Transmitter Function. Only the hand-held es!lok Transmitters will lock out the drill.

Portable Power Source included with System A-B

IMPORTANT:

- Read and follow the instructions Appendix A: Booster Pac® Brand Users Manual and Material Safety Data Sheet. These documents are provided by the Booster Pac supplier and are included in this manual for the convenience of our customers.

The es!lok System includes a multi-purpose power supply to provide power to the Exit Side Receiver. It can also be used to charge batteries for the hand-held es!lok Transmitters. The Booster Pac supplied with the es!lok System is not intended for any other uses. The Booster Pac should be kept at full charge. Recharge when first received, immediately after each use, and every three months if not used. Failure to do this may cause the battery life to be reduced greatly.

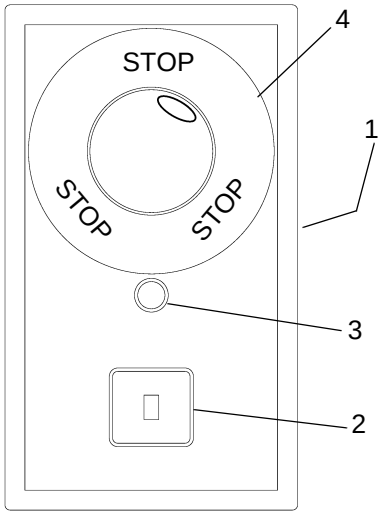
The Booster Pac contains a sealed lead-acid battery. Follow all safety precautions as described in Appendix A when charging/recharging, handling, using and disposing of these batteries. Do not use the Booster Pac if it has been damaged or is leaking battery acid.

Troubleshooting

Troubleshooting the es!lok System

Problem	Cause	Solution
Receiver does not turn on	No input power	Check power source and cables
No indicator lights are on	Blown fuse	Check fuse in Receiver and replace if necessary (8ER10017, 6.3 Amp fuse)
Yellow operation light blinking on the side of the Receiver, green signal light above switch off	es!lok Transmitter not on	Press START button on hand-held es!lok Transmitter
	Battery discharged	Check es!lok Transmitter battery
Nuisance tripping (unwanted shut-downs)	Incorrect placement of es!lok Transmitter	Do not place the es!lok Transmitter within 15 feet (4.5 m) of the Receiver. The driller should not wear the es!lok Transmitter while at the driller's station.
	es!lok Transmitter taken outside operating radius	Do not exceed stated operating radius
		Turn off es!lok selector in the Drill Side Receiver or Exit Side Receiver for the offending es!lok Transmitter
	Use of Long Range Antenna closer than 3000 ft (915 m)	Use Standard Range (mini-flex) Antenna
	Two es!lok Transmitters on the same frequency in close proximity (100 yards or 90 m depending on atmospheric conditions)	Check for other es!lok systems operating nearby. Call factory for instructions to change the frequency of one system
		Use alternate transmitter
System operates intermittently	Rig mounted antenna in contact with rig, grounding out	Adjust antenna mounting
	Antenna connections are loose or wet	Tighten connections. Dry wet connections
	Intermittent power loss	Check power source Check for loose wire connections
	Electrical noise interference	The es!lok system will shut down if electrical noise interferes with the signal. Find and eliminate the source of the electrical noise.
Short battery life	Incorrect charging	Ensure batteries are completely charged. Discharge batteries completely before recharging
	Cold weather	Keep es!lok Transmitter next to the body (inside a coat, for example)

Quick Reference Guide

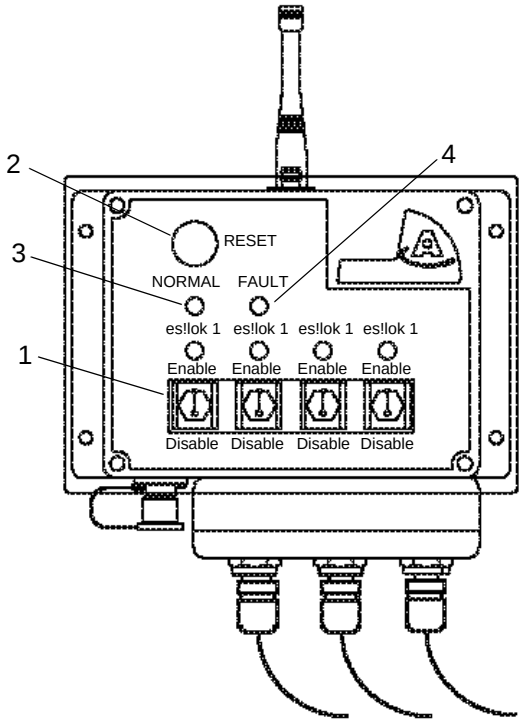


Typical hand-held es!lok Transmitter

1. Install a charged battery
2. Press START button
3. Indicator will flash green when transmitter is operating
4. Press STOP button to lock out the drill rig. Indicator will change to red momentarily.
5. To return to normal function, press START. Receiver must be reset by drill operator.

Drill Side and Exit Side Receiver

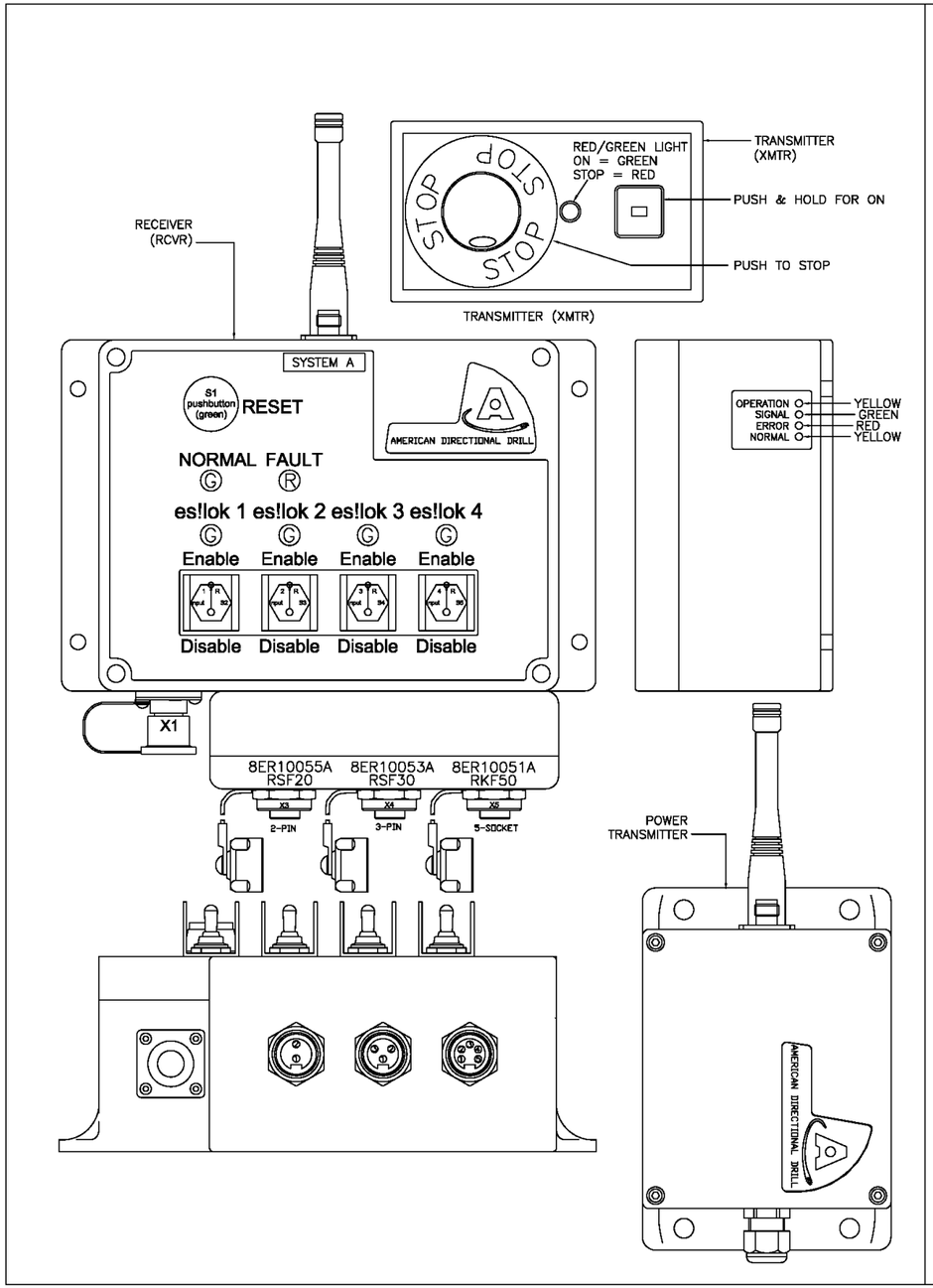
1. Enable the channel that matches es!lok Transmitter.
2. Press RESET switch.
3. Confirm that es!lok Transmitter has been activated. NORMAL light will glow green.
4. When STOP button is pushed on es!lok Transmitter, FAULT light will glow red. (Other operational faults will cause drill to stop and FAULT light to glow red.)
5. To return to normal operation, press START button on es!lok Transmitter and press RESET (2) switch.

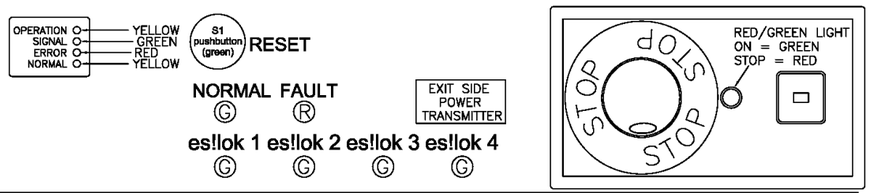


To Completely Discharge Ni-MH Batteries

Batteries may not recharge fully unless they have been completely discharged. To discharge, place a battery in a hand-held es!lok Transmitter and switch the power ON for a full day (24 hours). Then place the battery in the charger. The batteries have a useful life of 1000 charging cycles, about 3 years.

6ER30010A - es!lok Diagnostic Light Chart

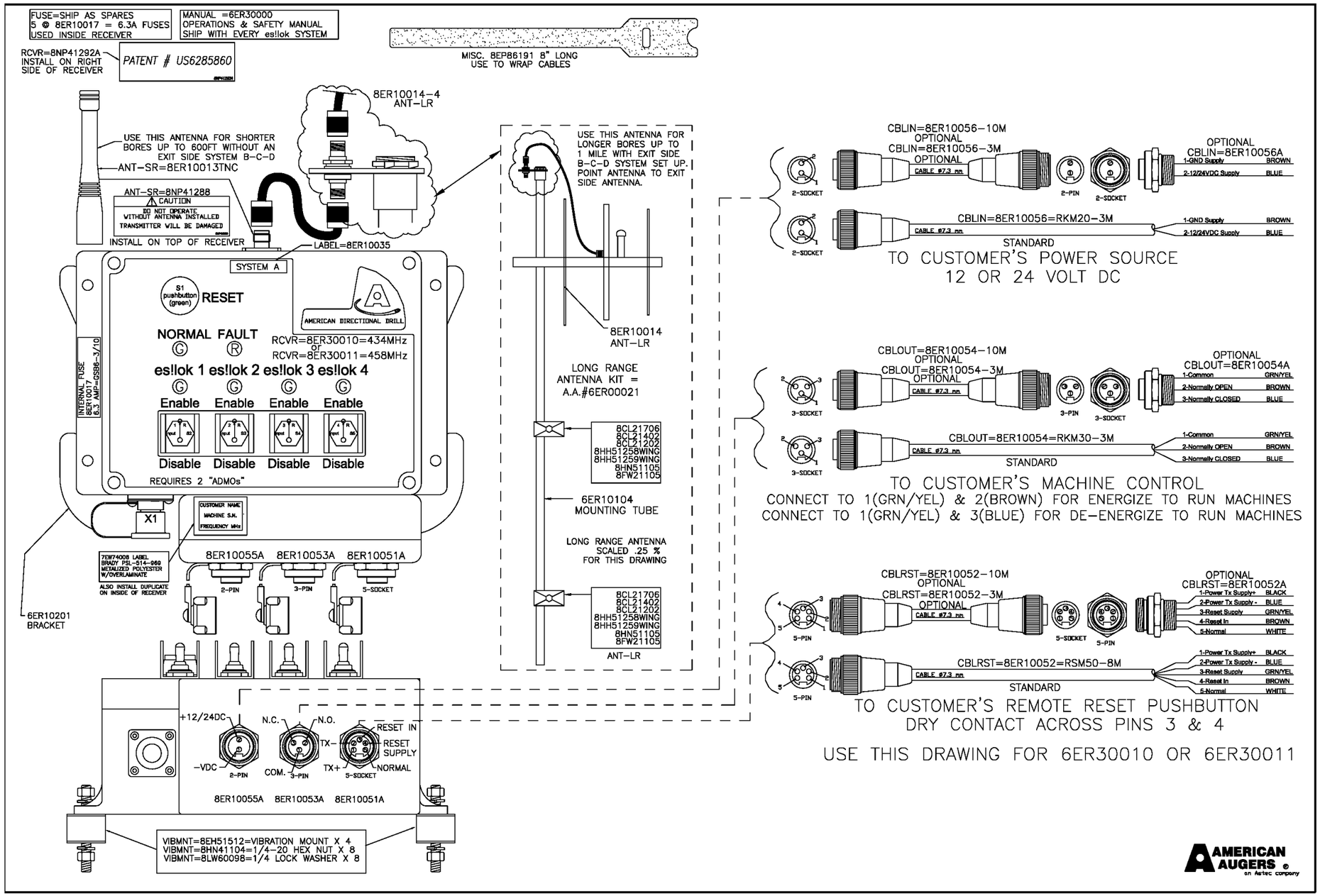




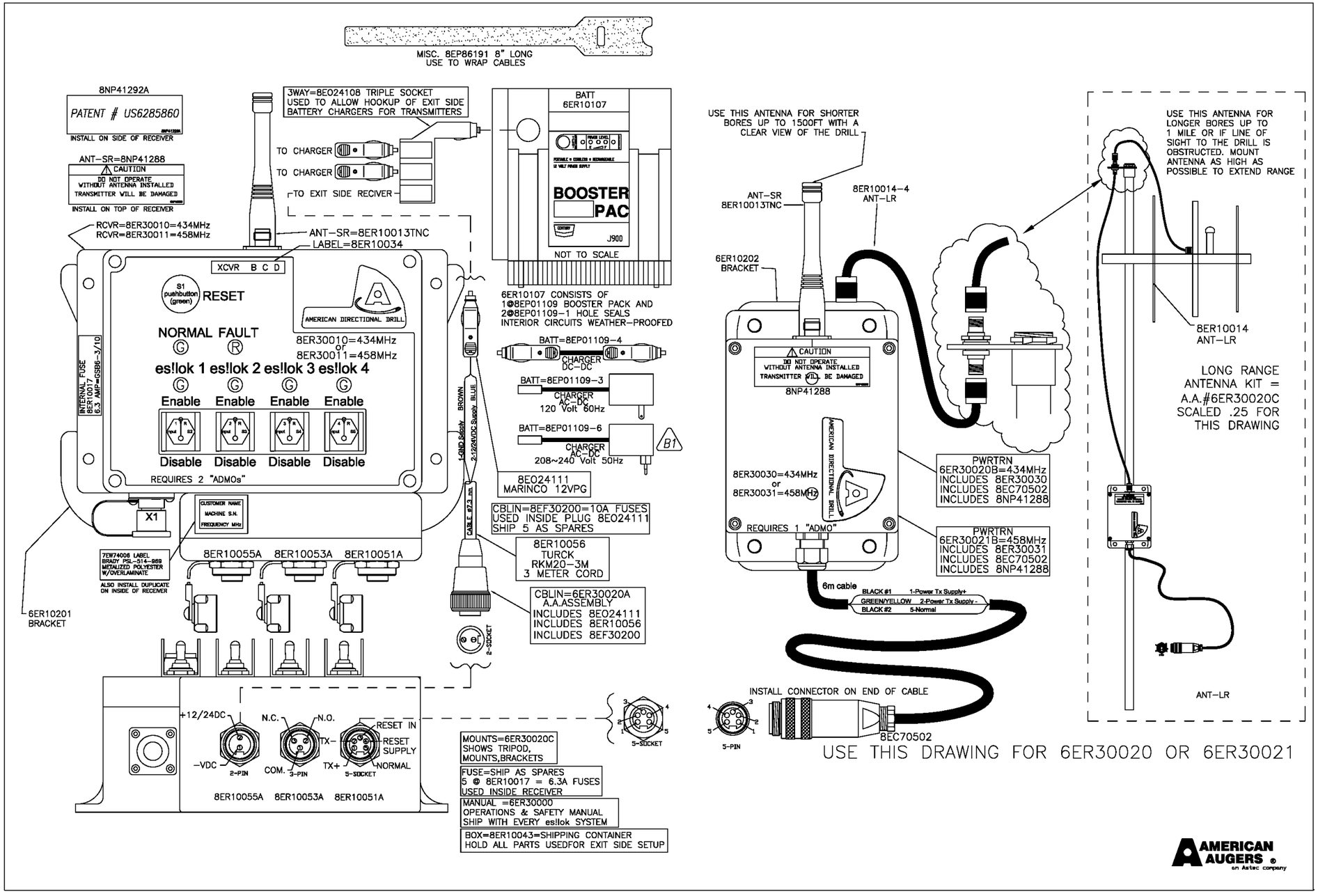
LOCATION	FUNCTIONS	RECEIVER (RCVR) SIDE LIGHTS				RECEIVER (RCVR) FRONT LIGHTS				TRANSMITTER(XMTR)		MACHINE
DRILL SIDE EXIT SIDE	STATUS	OPERATION YELLOW	SIGNAL GREEN	ERROR RED	NORMAL YELLOW	NORMAL GREEN	FAULT RED	es!lok1 GREEN	es!lok2 GREEN	es!lok1 RED/GRN	es!lok2 RED/GRN	MACHINE STATUS
DRILL SIDE	RECEIVER POWER OFF											LOCKED OUT
	RECEIVER POWER ON	SLOW BLINK					SOLID RED					LOCKED OUT
	RCVR es!lok A1 SWITCH ENABLE	SLOW BLINK					SOLID RED					LOCKED OUT
	XMTR es!lok A1 TURNED ON	SLOW BLINK	FAST BLINK		SOLID YELLOW		SOLID RED	SOLID GREEN		BLINK GREEN		LOCKED OUT
	DRILL SIDE RESET PUSHED IN	SLOW BLINK	FAST BLINK		SOLID YELLOW	SOLID GREEN		SOLID GREEN		BLINK GREEN		ENABLED
	XMTR es!lok A1 PUSH STOP	SLOW BLINK					SOLID RED			BLINK RED THEN OFF		LOCKED OUT
	RCVR es!lok A1&A2 SWITCHES ENABLE	SLOW BLINK					SOLID RED					LOCKED OUT
	XMTRS es!lok A1&A2 TURNED ON	SLOW BLINK	FAST BLINK		SOLID YELLOW		SOLID RED	SOLID GREEN	SOLID GREEN	BLINK GREEN	BLINK GREEN	LOCKED OUT
	DRILL SIDE RESET PUSHED IN	SLOW BLINK	FAST BLINK		SOLID YELLOW	SOLID GREEN		SOLID GREEN	SOLID GREEN	BLINK GREEN	BLINK GREEN	ENABLED
	XMTR es!lok A1orA2 PUSH STOP	SLOW BLINK					SOLID RED			BLINK RED THEN OFF	BLINK RED THEN OFF	LOCKED OUT
EXIT SIDE SEE NOTE 1 BELOW	RECEIVER POWER OFF											LOCKED OUT
	RECEIVER POWER ON	SLOW BLINK					SOLID RED					LOCKED OUT
	RCVR es!lok B1 SWITCH ENABLE	SLOW BLINK					SOLID RED					LOCKED OUT
	XMTR es!lok B1 TURNED ON	SLOW BLINK	FAST BLINK		SOLID YELLOW		SOLID RED	SOLID GREEN		BLINK GREEN		LOCKED OUT
	EXIT SIDE RESET PUSHED IN	SLOW BLINK	FAST BLINK		SOLID YELLOW	SOLID GREEN		SOLID GREEN		BLINK GREEN		LOCKED OUT
	DRILL SIDE RESET PUSHED IN	SLOW BLINK	FAST BLINK		SOLID YELLOW	SOLID GREEN		SOLID GREEN		BLINK GREEN		ENABLED
	XMTR es!lok B1 PUSH STOP	SLOW BLINK					SOLID RED			BLINK RED THEN OFF		LOCKED OUT
	RCVR es!lok B1&B2 SWITCHES ENABLE	SLOW BLINK					SOLID RED					LOCKED OUT
	XMTRS es!lok B1&B2 TURNED ON	SLOW BLINK	FAST BLINK		SOLID YELLOW		SOLID RED	SOLID GREEN	SOLID GREEN	BLINK GREEN	BLINK GREEN	LOCKED OUT
	EXIT SIDE RESET PUSHED IN	SLOW BLINK	FAST BLINK		SOLID YELLOW	SOLID GREEN		SOLID GREEN	SOLID GREEN	BLINK GREEN	BLINK GREEN	LOCKED OUT
	DRILL SIDE RESET PUSHED IN	SLOW BLINK	FAST BLINK		SOLID YELLOW	SOLID GREEN		SOLID GREEN	SOLID GREEN	BLINK GREEN	BLINK GREEN	ENABLED
	XMTR es!lok B1orB2 PUSH STOP	SLOW BLINK					SOLID RED			BLINK RED THEN OFF	BLINK RED THEN OFF	LOCKED OUT

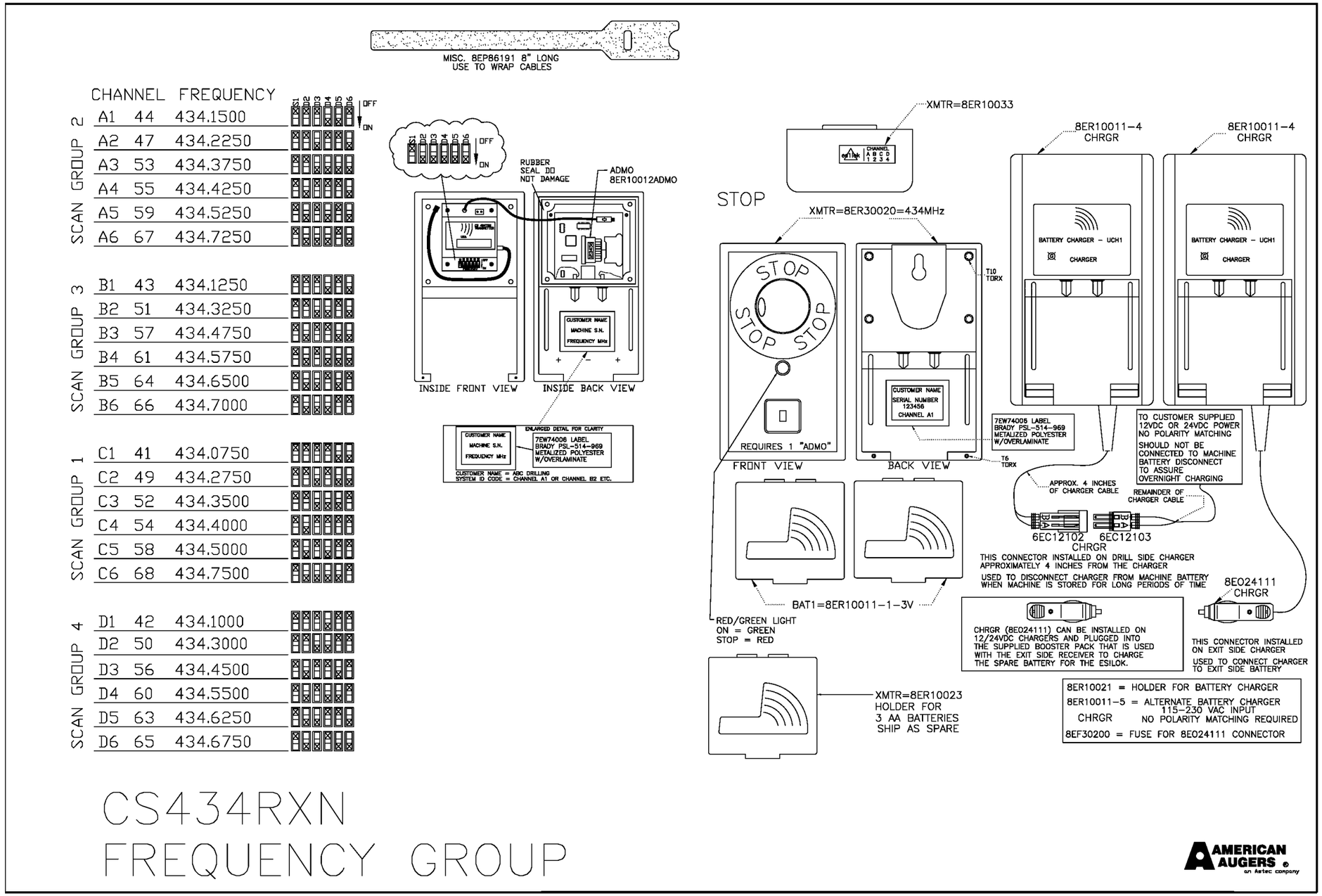
NOTE 1; THE EXIT SIDE POWER TRANSMITTER'S SIGNAL IS RECEIVED BY THE DRILL SIDE es!lok SWITCH #4. TO PROPERLY USED THE SYSTEM THE DRILL SIDE es!lok SWITCH # 4 MUST BE ON TO RECEIVE THE EXIT SIDE POWER TRANSMITTER'S SIGNAL AND THEN THE DRILL SIDE RESET PUSHBUTTON MUST BE PRESSED TO ENABLE THE MACHINE.
THE EXIT SIDE RESET PUSHBUTTON DOES NOT HAVE TO BE PRESSED TO ALLOW THE MACHINE TO BE ENABLED. RESETTING THE EXIT SIDE WOULD ONLY ENABLE CIRCUITS CONNECTED TO THE EXIT SIDE 3 PIN CONNECTOR.

AMERICAN AUGERS ®
an Astec company

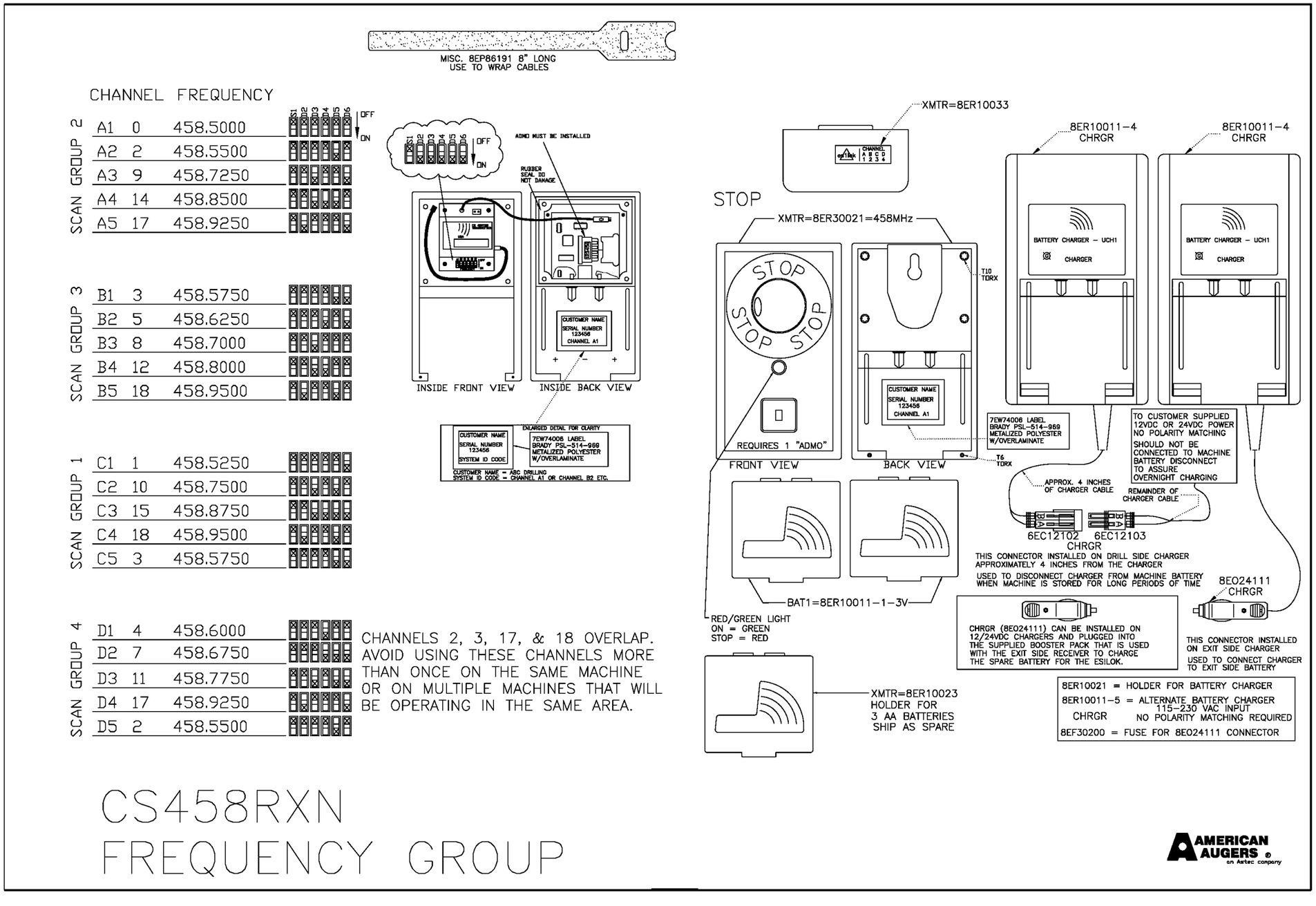

FUSE=SHIP AS SPARES
5 @ 8ER10017 = 6.3A FUSES
USED INSIDE RECEIVER
MANUAL =6ER30000
OPERATIONS & SAFETY MANUAL
SHIP WITH EVERY es!lok SYSTEM
RCVR=8NP41292A
INSTALL ON RIGHT
SIDE OF RECEIVER
PATENT # US6285860
MISC. 8EP86191 8" LONG
USE TO WRAP CABLES
8ER10014-4
ANT-LR
USE THIS ANTENNA FOR SHORTER
BORES UP TO 600FT WITHOUT AN
EXIT SIDE SYSTEM B-C-D
ANT-SR=8ER10013TNC
ANT-SR=8NP41288
CAUTION
DO NOT OPERATE
WITHOUT ANTENNA INSTALLED
TRANSMITTER WILL BE DAMAGED
INSTALL ON TOP OF RECEIVER
LABEL=8ER10035
USE THIS ANTENNA FOR
LONGER BORES UP TO
1 MILE WITH EXIT SIDE
B-C-D SYSTEM SET UP.
POINT ANTENNA TO EXIT
SIDE ANTENNA.
SYSTEM A
S1
pushbutton
(green)
RESET
AMERICAN DIRECTIONAL DRILL
NORMAL FAULT
RCVR=8ER30010=434MHz
or
RCVR=8ER30011=458MHz
es!lok 1 es!lok 2 es!lok 3 es!lok 4
Enable Enable Enable Enable
Disable Disable Disable Disable
REQUIRES 2 "ADMOs"
INTERNAL FUSE
8ER10017
6.3 AMP-QSB6-3/10
X1
CUSTOMER NAME
MACHINE S.N.
FREQUENCY MHz
7EW74006 LABEL
BRADY PSL-514-969
METALIZED POLYESTER
W/OVERLAMINATE
ALSO INSTALL DUPLICATE
ON INSIDE OF RECEIVER
8ER10055A 8ER10053A 8ER10051A
2-PIN 3-PIN 5-SOCKET
6ER10201
BRACKET
8ER10014
ANT-LR
LONG RANGE
ANTENNA KIT =
A.A.#6ER00021
8CL21706
8CL21402
8CL21202
8HH51258WING
8HH51259WING
8HN51105
8FW21105
6ER10104
MOUNTING TUBE
LONG RANGE ANTENNA
SCALED .25 %
FOR THIS DRAWING
8CL21706
8CL21402
8CL21202
8HH51258WING
8HH51259WING
8HN51105
8FW21105
ANT-LR
+12/24DC
N.C.
N.O.
RESET IN
TX-
RESET
SUPPLY
-VDC
COM.
TX+
NORMAL
2-PIN 3-PIN 5-SOCKET
8ER10055A 8ER10053A 8ER10051A
VIBMNT=8EH51512=VIBRATION MOUNT X 4
VIBMNT=8HN41104=1/4-20 HEX NUT X 8
VIBMNT=8LW60098=1/4 LOCK WASHER X 8
CBLIN=8ER10056-10M
OPTIONAL
CBLIN=8ER10056-3M
OPTIONAL
CABLE ø7.3 mm
2-PIN
2-SOCKET
OPTIONAL
CBLIN=8ER10056A
1-GND Supply BROWN
2-12/24VDC Supply BLUE
2-SOCKET
CBLIN=8ER10056=RKM20-3M
CABLE ø7.3 mm
STANDARD
1-GND Supply BROWN
2-12/24VDC Supply BLUE
2-SOCKET
TO CUSTOMER'S POWER SOURCE
12 OR 24 VOLT DC
CBLOUT=8ER10054-10M
OPTIONAL
CBLOUT=8ER10054-3M
OPTIONAL
CABLE ø7.3 mm
3-PIN
3-SOCKET
OPTIONAL
CBLOUT=8ER10054A
1-Common GRN/YEL
2-Normally OPEN BROWN
3-Normally CLOSED BLUE
3-SOCKET
CBLOUT=8ER10054=RKM30-3M
CABLE ø7.3 mm
STANDARD
1-Common GRN/YEL
2-Normally OPEN BROWN
3-Normally CLOSED BLUE
3-SOCKET
TO CUSTOMER'S MACHINE CONTROL
CONNECT TO 1(GRN/YEL) & 2(BROWN) FOR ENERGIZE TO RUN MACHINES
CONNECT TO 1(GRN/YEL) & 3(BLUE) FOR DE-ENERGIZE TO RUN MACHINES
CBLRST=8ER10052-10M
OPTIONAL
CBLRST=8ER10052-3M
OPTIONAL
CABLE ø7.3 mm
5-PIN
5-SOCKET
OPTIONAL
CBLRST=8ER10052A
1-Power Tx Supply+ BLACK
2-Power Tx Supply - BLUE
3-Reset Supply GRN/YEL
4-Reset In BROWN
5-Normal WHITE
5-PIN
CBLRST=8ER10052=RSM50-8M
CABLE ø7.3 mm
STANDARD
1-Power Tx Supply+ BLACK
2-Power Tx Supply - BLUE
3-Reset Supply GRN/YEL
4-Reset In BROWN
5-Normal WHITE
5-PIN
TO CUSTOMER'S REMOTE RESET PUSHBUTTON
DRY CONTACT ACROSS PINS 3 & 4
USE THIS DRAWING FOR 6ER30010 OR 6ER30011
AMERICAN AUGERS
an Astec company

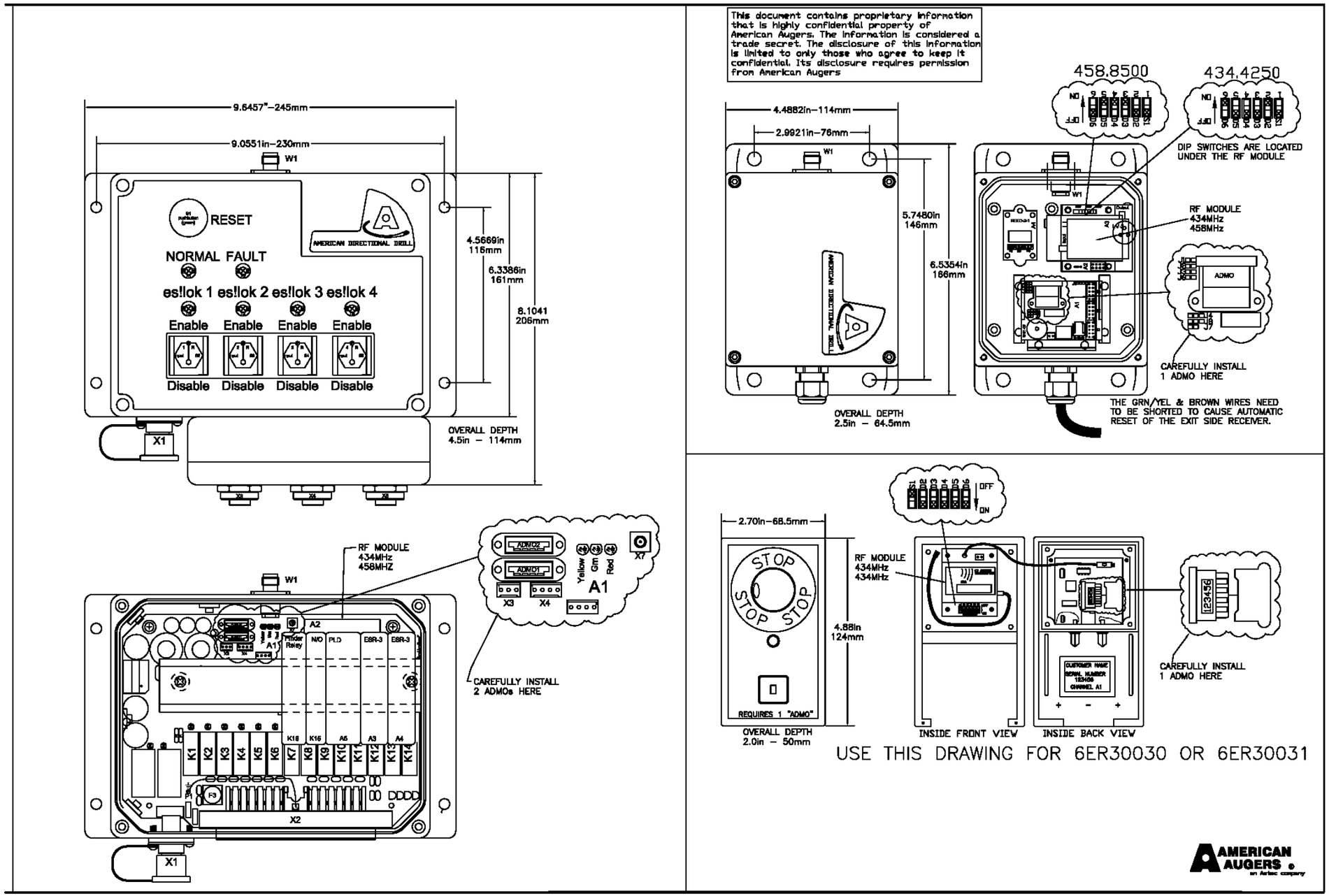
6ER30020 or 6ER30021 - es!lok Exit Side Receiver Assembly




MISC. 8EP86191 8" LONG
USE TO WRAP CABLES
CHANNEL FREQUENCY
SCAN GROUP 2
A1 44 434.1500
A2 47 434.2250
A3 53 434.3750
A4 55 434.4250
A5 59 434.5250
A6 67 434.7250
SCAN GROUP 3
B1 43 434.1250
B2 51 434.3250
B3 57 434.4750
B4 61 434.5750
B5 64 434.6500
B6 66 434.7000
SCAN GROUP 1
C1 41 434.0750
C2 49 434.2750
C3 52 434.3500
C4 54 434.4000
C5 58 434.5000
C6 68 434.7500
SCAN GROUP 4
D1 42 434.1000
D2 50 434.3000
D3 56 434.4500
D4 60 434.5500
D5 63 434.6250
D6 65 434.6750
S1 S2 S3 S4 S5 S6
OFF
ON
RUBBER SEAL DO NOT DAMAGE
ADMO 8ER10012ADMO
CUSTOMER NAME
MACHINE S.N.
FREQUENCY MHz
INSIDE FRONT VIEW
INSIDE BACK VIEW
ENLARGED DETAIL FOR CLARITY
7EW74006 LABEL
BRADY PSL-514-969
METALIZED POLYESTER
W/OVERLAMINATE
CUSTOMER NAME = ABC DRILLING
SYSTEM ID CODE = CHANNEL A1 OR CHANNEL B2 ETC.
XMTR=8ER10033
CHANNEL A B C D 1 2 3 4
STOP
XMTR=8ER30020=434MHz
REQUIRES 1 "ADMO"
FRONT VIEW
BACK VIEW
T10 TORX
T6 TORX
CUSTOMER NAME
SERIAL NUMBER 123456
CHANNEL A1
7EW74005 LABEL
BRADY PSL-514-969
METALIZED POLYESTER
W/OVERLAMINATE
8ER10011-4 CHRGR
8ER10011-4 CHRGR
BATTERY CHARGER - UCH1
CHARGER
TO CUSTOMER SUPPLIED 12VDC OR 24VDC POWER
NO POLARITY MATCHING
SHOULD NOT BE CONNECTED TO MACHINE BATTERY DISCONNECT TO ASSURE OVERNIGHT CHARGING
APPROX. 4 INCHES OF CHARGER CABLE
REMAINDER OF CHARGER CABLE
6EC12102 6EC12103
CHRGR
THIS CONNECTOR INSTALLED ON DRILL SIDE CHARGER APPROXIMATELY 4 INCHES FROM THE CHARGER
USED TO DISCONNECT CHARGER FROM MACHINE BATTERY WHEN MACHINE IS STORED FOR LONG PERIODS OF TIME
8EO24111 CHRGR
BAT1=8ER10011-1-3V
RED/GREEN LIGHT
ON = GREEN
STOP = RED
CHRGR (8EO24111) CAN BE INSTALLED ON 12/24VDC CHARGERS AND PLUGGED INTO THE SUPPLIED BOOSTER PACK THAT IS USED WITH THE EXIT SIDE RECEIVER TO CHARGE THE SPARE BATTERY FOR THE ESILOK.
THIS CONNECTOR INSTALLED ON EXIT SIDE CHARGER
USED TO CONNECT CHARGER TO EXIT SIDE BATTERY
XMTR=8ER10023
HOLDER FOR
3 AA BATTERIES
SHIP AS SPARE
8ER10021 = HOLDER FOR BATTERY CHARGER
8ER10011-5 = ALTERNATE BATTERY CHARGER 115-230 VAC INPUT
CHRGR NO POLARITY MATCHING REQUIRED
8EF30200 = FUSE FOR 8EO24111 CONNECTOR
CS434RXN
FREQUENCY GROUP
AMERICAN AUGERS
an Astec company

6ER30031 - es!lok Transmitter Assembly, 458 MHz




This document contains proprietary information that is highly confidential property of American Augers. The information is considered a trade secret. The disclosure of this information is limited to only those who agree to keep it confidential. Its disclosure requires permission from American Augers
9.6457"–245mm
9.0551in–230mm
W1
RESET
NORMAL FAULT
es!lok 1 es!lok 2 es!lok 3 es!lok 4
Enable Enable Enable Enable
Disable Disable Disable Disable
AMERICAN DIRECTIONAL DRILL
4.5669in 116mm
6.3386in 161mm
8.1041 206mm
OVERALL DEPTH 4.5in – 114mm
X1
458.8500
434.4250
DIP SWITCHES ARE LOCATED UNDER THE RF MODULE
4.4882in–114mm
2.9921in–76mm
5.7480in 146mm
6.5354in 166mm
RF MODULE 434MHz 458MHz
ADMO
CAREFULLY INSTALL 1 ADMO HERE
THE GRN/YEL & BROWN WIRES NEED TO BE SHORTED TO CAUSE AUTOMATIC RESET OF THE EXIT SIDE RECEIVER.
OVERALL DEPTH 2.5in – 64.5mm
RF MODULE 434MHz 458MHZ
ADMO2
ADMO1
Yellow Grn Red
X7
A1
X3
X4
W1
A2
A11
Timer Relay
N/O
PLD
ESR-3
ESR-3
K1 K2 K3 K4 K5 K6 K7 K8 K9 K10 K11 K12 K13 K14
K18 K16 A5 A3 A4
X2
X1
CAREFULLY INSTALL 2 ADMOs HERE
2.70in–68.5mm
STOP STOP STOP
REQUIRES 1 "ADMO"
4.88in 124mm
OVERALL DEPTH 2.0in – 50mm
RF MODULE 434MHz 434MHz
INSIDE FRONT VIEW
INSIDE BACK VIEW
123456
CAREFULLY INSTALL 1 ADMO HERE
USE THIS DRAWING FOR 6ER30030 OR 6ER30031
AMERICAN AUGERS
an Astec company

Parts Lists

es!lok Parts List

Item #/Frequency	Part Number	Description
es!lok Manual,es!lok,Operation & Safety	6ER30000	
es!lok System - 600 FT. Range / 434MHz	6ER30001	A-System
es!lok System - 600 FT. Range / 458MHz	6ER30002	A-System
es!lok System - 1 Mile Range / 434MHz	6ER30003	A-B System
es!lok System - 1 Mile Range / 458MHz	6ER30004	A-B System
es!lok System - 2 Mile Range / 434MHz	6ER30005	A-B-C System
es!lok System - 2 Mile Range / 458MHz	6ER30006	A-B-C System
es!lok System - 3 Mile Range / 434MHz	6ER30007	A-B-C-D System
es!lok System - 3 Mile Range / 458MHz	6ER30008	A-B-C-D System
es!lok Receiver Assembly / 434 MHz	6ER30010	A Side Receiver Assembly -Drill Side
es!lok Receiver Assembly / 458MHz	6ER30011	A Side Receiver Assembly -Drill Side
es!lok Transceiver Assembly / 434 MHz	6ER30020	B-C-D Side Receiver Assembly - Exit Side
es!lok Transceiver Assembly / 458MHz	6ER30021	B-C-D Side Receiver Assembly - Exit Side
es!lok Transmitter Assembly / 434 MHz	6ER30030	Transmitter Assembly
es!lok Transmitter Assembly / 458MHz	6ER30031	Transmitter Assembly
es!lok Receiver /434MHz	8ER30010	Receiver - Drill Side Or Exit Side
es!lok Receiver /458MHz	8ER30011	Receiver - Drill Side Or Exit Side
es!lok Transmitter /434MHz	8ER30020	Hand Held /Belt Transmitter - Drill Side or Exit Side
es!lok Transmitter /458MHz	8ER30021	Hand Held /Belt Transmitter - Drill Side or Exit Side
es!lok Power Transmitter / 434MHz	8ER30030	Exit Side Power Transmitter - Exit Side
es!lok Power Transmitter / 458MHz	8ER30031	Exit Side Power Transmitter - Exit Side

Drill Side Receiver Assembly Component Parts (6ER30010)

Bubble #	Part Number	Description	Optional?
ADMO	8ER10012ADMO	ADMO, REQUIRES INDIVIDUAL	
ANT-LR	6ER00021	ANTENNA KIT LONG RANGE	
ANT-LR	8ER10014-6	CAP,MALE ,WITH CHAIN	
ANT-SR	8ER10013TNC	ANTENNA MINI-FLEX	
CBLIN	8ER10056	CABLE,18GA-2SOC,FEMALE,3 METER	
CBLIN	8ER10056-10M	CABLE,18GA,2PIN-2SOC,10-METER	OPTIONAL
CBLIN	8ER10056-3M	CABLE,18GA,2PIN-2SOC,3-METER	OPTIONAL
CBLIN	8ER10056A	CONN,FLNG,18GA-2SOC,FEMALE,8"	OPTIONAL
CBLOUT	8ER10054	CABLE,18GA-3SOC,FEMALE,3 METER	
CBLOUT	8ER10054-10M	CABLE,18GA,3PIN-3SOC,10-METER	OPTIONAL
CBLOUT	8ER10054-3M	CABLE,18GA,3PIN-3SOC,3-METER	OPTIONAL
CBLOUT	8ER10054A	CONN,FLNG,18GA-3SOC,FEMALE,8"	OPTIONAL
CBLRST	8ER10052	CABLE,18GA-5PIN,MALE,8 METERS	
CBLRST	8ER10052-10M	CABLE,18GA,5PIN-5SOC,10-METER	OPTIONAL
CBLRST	8ER10052-3M	CABLE,18GA,5PIN-5SOC,3-METER	OPTIONAL
CBLRST	8ER10052A	CONN,FLNG,18GA-5PIN,MALE,8"	OPTIONAL
LABEL	8ER10035	LEGEND PLATE; SYSTEM A-B-C-D	
LABEL	8ER10036	LEGEND PLATE,"EXIT SIDE POW.."	
RCVR	8NP41292A	STICKER; "PATENT # US6285860"	
SPARES	8ER10017	FUSE, 6.3 AMP GSB 6-3/10	
VIBMNT	8EH51512	VIBRATION MOUNT,1/4-20,SS TYPE	
VIBMNT	8HN41104	NUT,HEX,1/4-20 UNC	
VIBMNT	8LW60098	WASHER,LOCK,SPLIT TYPE 1/4"	

Parts Lists

Exit Side Receiver Assembly Component Parts (6ER30020)

Bubble #	Part Number	Description	Optional?
3WAY	8EO24108	CIGARETTE LIGHTR TRIPLE SOCKET	
ADMO	8ER10012ADMO	ADMO, REQUIRES INDIVIDUAL	
ANT-LR	6ER00021	ANTENNA KIT LONG RANGE	
ANT-LR	8ER10014-6	CAP,MALE ,WITH CHAIN	
ANT-SR	8ER10013TNC	ANTENNA MINI-FLEX	OPTIONAL
BATT	6ER10107	BOOSTER PACK,12V,W/HOLE SEALS	
BATT	8EP01109-3	CHARGER,110VAC,W/ELE JACK PLUG	OPTIONAL
BATT	8EP01109-4	EXTENSION CORD,M.CIG./M.CIG.	OPTIONAL
BATT	8EP01109-6	CHARGER, 208-240VAC, W/EURO-PLUG	
BOX	8ER10044	SHIPPING BOX (ACTION PACKER)	
BOX	8ER10045	DIVIDER BOX FOR 8ER10044 (2 EACH)	
CBLIN	6ER30020A	CABLE ASSY.RCVR.-BOOSTER PAC	
CBLIN	8EF30200	FUSE, 10AMP, NO TIME DELAY	
LABEL	8ER10034	LEGEND PLATE; EXCVR B-C-D	
MANUAL	6ER30000	MANUAL,ES!LOK OPER.AND SAFETY	
PWRTRN	6ER30020B	POWER TRANSMITTER ASSY.434MHz	
PWRTRN	6ER30020C	POWER TRANSMITTER ASSY.458MHz	
PWRTRN	6ER10104	TUBE, MOUNT, ANT-LR/PWR XMTR	
PWRTRN	6ER10105	STAKE FOR POWER TRANSMITTER	
PWRTRN	8CP50801	PIN,SAFETY,SNAP 1/4 DIAx1-3/4	
PWRTRN	8EC70502	CONN.MALE,STR.,5 PIN,PG 13.5	
PWRTRN	8ER30030	POWER TRANSMITTER; 434MHZ	
PWRTRN	8ER30031	POWER TRANSMITTER; 458MHZ	
PWRTRN	8NP41288	STICKER;CAUTION-DO NOT OPERATE	
RCVR	8ER30010	RECEIVER;434MHz	
RCVR	8ER30011	RECEIVER;458MHz	
RCVR	8NP41292A	STICKER; "PATENT # US6285860"	
SPARES	8ER10017	FUSE, 6.3 AMP GSB 6-3/10	
TRIPOD	8ER10125	TRIPOD,63",ALUM;CONST.GRADE	
VIBMNT	8EH51512	VIBRATION MOUNT,1/4-20,SS TYPE	
VIBMNT	8HN41104	NUT,HEX,1/4-20 UNC	
VIBMNT	8LW60098	WASHER,LOCK,SPLIT TYPE 1/4"	

es!lok Transmitter Assembly Component Parts (6ER30030)

Bubble #	Part Number	Description	Optional?
ADMO	8ER10012ADMO	ADMO, REQUIRES INDIVIDUAL	
BAT1	8ER10011-1-3V	BATTERY/ES!LOK TRANSMITTER 3V	
CHRGR	6EC12102-01	CONN.,PACKARD,2 PIN,14/16 AWG	
CHRGR	6EC12103-01	CONN.,PACKARD,2 SOC,14/16 AWG	
CHRGR	8EF30200	FUSE, 10AMP, NO TIME DELAY	
CHRGR	8EO24111	PLUG;CIG.LIGHTER TYPE;10A-FUSE	
CHRGR	8ER10011-4	CHARGER/ES!LOK 12/24V FOR 3V	
CHRGR	8ER10011-5	CHARGER/ES!LOK 115/230V FOR 3V	OPTIONAL
CHRGR	8ER10021	HOLDER FOR 1 BATTERY CHARGER	
XMTR	7EW74006	LABEL/LS2000,PERMASHIELD 32135	
XMTR	8ER10023	BATTERY HOLDER FOR 3 EACH AA	
XMTR	8ER10033	LEGEND PLATE, es!lok CHANNEL	
XMTR	8ER30020	TRANSMITTER; 434MHz	
XMTR	8ER30021	TRANSMITTER; 458MHz	

Parts Lists

Receiver Service Parts; 434 MHz and 458 MHz

Bubble #	Part Number	Description	Optional?
RCVR	8ER30010-01	RX MODULE;14HL W/434MHZ	
RCVR	8ER30011-01	RX MODULE;14HL W/458MHZ	
RCVR	8ER30010-02	PUSHBUTTON,GREEN,RESET	
RCVR	8ER30010-03	SWITCH,TOGGLE,HETROINC O-R	
RCVR	8ER30010-04	GUARD,RED,FOR TOGGLE SWITCH	
RCVR	8ER30010-05	LIGHT,LED,GREEN	
RCVR	8ER30010-06	LIGHT,LED,RED	
RCVR	8ER30010-07	LABEL SET; FOR ES!LOK RECEIVER	
RCVR	8ER30010-08	CONNECTOR,2 PIN, RSF20	
RCVR	8ER30010-09	CONNECTOR,3 PIN, RSF30	
RCVR	8ER30010-10	CONNECTOR,5 SOCKET, RKF50	
RCVR	8ER30010-11	BOX,LARGE,FOR RECEIVER	
RCVR	8ER30010-12	BOX,SMALL,FOR RECEIVER	
RCVR	8ER10016	JUMPER FOR CIRCUIT BOARDS	

Notes

NOTES:

Appendix A: Booster Pac User's Manual

BOOSTER PAC® BRAND

User's Manual

Warning: This product contains chemicals, including lead, known to the State of California to cause cancer, birth defects and other reproductive harm. ***Wash hands after handling.***

⚠WARNING

Failure to follow instructions may cause damage or explosion, always shield eyes. **Read entire instruction manual before use.**

Congratulations! You have just purchased the finest quality portable power source and jump starter on the market. We have taken numerous measures in quality control and in our manufacturing processes to ensure that your product arrives in top condition, and that it will perform to your satisfaction.

In the rare event that your Booster PAC contains a damaged or missing item, does not perform as specified, or requires warranty service, please call Technical Service at (913) 310-1050. *Save your purchase receipt, it is required for warranty service.*

This unit has a sealed lead-acid battery that should be kept at full charge. Recharge when first received, immediately after each use, and every three months if not used. Failure to perform maintenance charges may cause the battery life to be reduced greatly.

SAFETY SUMMARY

⚠WARNING	
	Read these instructions completely before using the ***Booster PAC*** and save them for future reference. Before using the ***Booster PAC*** to jump start a car, truck, boat or to power any equipment, read these instructions and the instruction manual/safety information provided by the car, truck, boat or equipment manufacturer. Following all manufacturers' instructions and safety procedures will reduce the risk of accident.
	Working around lead-acid batteries may be dangerous. Lead-acid batteries release explosive gases during normal operation, charging and jump starting. Carefully read and follow these instructions for safe use. Always follow the specific instructions in this manual and on the ***Booster PAC*** each time you jump start using the ***Booster PAC***. All lead-acid batteries (car, truck and boat) produce hydrogen gas which may violently explode in the presence of fire or sparks. **Do not smoke, use matches or a cigarette lighter while near batteries.** Do not handle the battery while wearing vinyl clothing because static electricity sparks are generated when vinyl clothing is rubbed. Review all cautionary material on the ***Booster PAC*** and in the engine compartment.
	Always wear eye protection, appropriate protective clothing and other safety equipment when working near lead-acid batteries. Do not touch eyes while working on or around lead-acid batteries.
	Always store clamps in their holsters, away from each other or common conductors. Improper storage of clamps may cause the clamps to come in contact with each other, or a common conductor, causing the battery to short circuit and generate high enough heat to ignite most materials.
	Use extreme care while working within the engine compartment, because moving parts may cause severe injury. Read and follow all safety instructions published in the vehicle's Owner's Manual.
	While the battery in the ***Booster PAC*** is a sealed unit with no free liquid acid, batteries being jump started with the ***Booster PAC*** unit likely contain liquid acids which are hazardous if spilled.

PERSONAL PRECAUTIONS

Someone should always be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.

Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes. Protective eyewear should always be worn when working near lead-acid batteries.

If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.

Be extra cautious to reduce risk of dropping a metal tool onto a battery. It might spark or short circuit the battery or another electrical part that may cause explosion.

Remove personal metal items such as rings, bracelets, necklaces and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.

Use the Booster PAC for jump starting *lead-acid batteries* ***only***. Do not use for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.

NEVER charge or jump start a frozen battery.

To prevent arcing, ***NEVER*** allow clamps to touch together or to contact the same piece of metal.

IMPORTANT SAFETY INSTRUCTIONS

Use of an attachment not recommended or sold by the manufacturer may result in a risk of damage to the unit or injury to personnel.

When using the wall charger or power extension cord, pull on the plug and **never on the wire** when disconnecting.

Do not recharge the Booster PAC with a damaged wall charger or power extension cord. Replace them immediately.

The Booster PAC may be used under any weather condition – rain, snow, hot or cold temperatures.

Do not submerge in water.

Do not operate with flammables such as gasoline, etc.

If the Booster PAC receives a sharp blow or is otherwise damaged in any way, have it checked by a qualified service person. If the Booster PAC is leaking battery acid, do not ship it. Take it to the closest battery recycler in your area.

Do not disassemble the Booster PAC. Have it checked by a qualified service person.

The Booster PAC should never be left in a completely discharged state for any period of time. Damage to the battery could be permanent, with poor performance as a result. When not in use, leave your Booster PAC connected to the wall charger or recharge every three (3) months.

OPERATION AND MAINTENANCE

Portable Power Source Features

The Booster PAC provides plenty of power for starting vehicles – more than enough to start most cars.

The Booster PAC will power most 12 Vdc accessories equipped with a male 12 Volt outlet plug. The DC outlet features automatic overload protection.

The unit features a test switch and LED lights. State of the art circuitry allows the unit to remain continuously connected to the charger without the risk of overcharging.

Safety Features

Safety storage holsters prevent accidental sparking of clamps and rotate 90° for easy clamp removal and replacement. Always re-holster the clamps after use.

Cable grooves lock the cables for clean storage (no hazardous or unsightly dangling wires). Always re-wrap cables and properly secure clamps after each use.

The Booster PAC contains the latest technology with its 12 Volt sealed, non-spillable battery and may be stored in any position.

RECHARGING PROCEDURES

Note: *Upon initial purchase, your Booster PAC should be charged for a minimum of 30 hours.*

Figure 2. Test Button, Charging, Power Levels and Charge Complete LEDs

Recharging Your Booster PAC

There are two ways to charge your Booster PAC. The recommended method is automatic charging with the provided wall charger. An alternative method is through the DC power outlet using the provided 12 Volt Male-Male Extension Cord. This second method is not automatic and must be monitored because the Booster PAC could be damaged due to overcharging.

Charging using the supplied wall charger (recommended method). This is the recommended charging method because it features automatic charging, eliminating the possibility of overcharging. With this method, the wall charger is connected to the Booster PAC through a small charging jack (pin jack), located on the rear of the unit. Recharging takes approximately 4 to 6 hours for each light that does not come on when the test button is pressed. With this method, your Booster PAC can be left connected to the wall charger indefinitely

1. Insert the wall charger pin into the CHARGING JACK (located in the rear of the Booster PAC).
2. Connect the wall charger AC/DC ADAPTOR to the AC outlet (the yellow CHARGING light will light). (See Figure 2.)
3. Allow the Booster PAC to charge until the CHARGE COMPLETE light comes on (you can monitor the progress by checking the red POWER LEVEL lights – when all three POWER LEVEL lights are lit the CHARGE COMPLETE light should come on).
4. Once the CHARGE COMPLETE light comes on, charge another three to six hours, (three hours is acceptable, but to ensure maximum output capability, six hours is preferred).

   Note: *The CHARGING COMPLETE LED indicates that the charging process is complete. It may illuminate for a short period after the charger is unplugged from the unit due to the surface charge, but this will only occur for a short time, which is normal. To assess the unit's readiness, monitor the Power Level LED's.*
5. If you are not planning to use your Booster PAC right away, you may leave it connected to the wall charger. We recommend that the wall charger remain connected to the Booster PAC when not in use.

Charging using the supplied 12 Volt Male-Male Extension Cord. This alternative charging method may be used when access to an AC outlet is unavailable.

1. Start the vehicle's engine.
2. Plug one end of the 12 Volt Male-Male Extension Cord into the Booster PAC 12 Volt outlet and the other end into a vehicle 12 Volt outlet.
3. Press the test button once every hour to check the POWER LEVEL. When all of the red lights and the CHARGE COMPLETE light come on, charge the Booster PAC another 1 to 2 hours to insure a complete recharge.

   Note: *The CHARGING COMPLETE LED indicates that the charging process is complete. It may illuminate for a short period after the cord is unplugged from the unit due to the surface charge, but this will only occur for a short time, which is normal. To assess the unit's readiness, monitor the Power Level LED's.*

   Note: DO NOT OVERCHARGE! *This is not an automatic method of charging the Booster PAC. You must frequently monitor the charging process (POWER LEVEL indicators by pressing the TEST button) to ensure the unit is not overcharged. Overcharging will damage your Booster PAC.*

OPERATING INSTRUCTIONS

Used as an Emergency Jump Starter

Note: *For optimum performance, do not store your Booster PAC below 50° when using as a jump starter. Never charge or jump start a frozen battery.*

1. Use in a well ventilated area.
2. Shield eyes. Always wear protective eyewear when working near batteries.
3. Review this instruction manual and the instruction/safety manual provided by the manufacturer of the vehicle being jump started.
4. Turn ignition off before making cable connections.
5. Clamp the positive (red +) clamp to the positive terminal on the vehicle battery (for negative ground system), or an alternate vehicle starting point as recommended by vehicle manufacturer.
6. Clamp the negative (black –) clamp to the vehicle frame (ground).
7. Make sure the cables are not in the path of moving engine parts (belts, fans, etc.).
8. Stay clear of batteries while jump starting.
9. Start the vehicle (turn on the vehicle ignition).

   Note: *If the vehicle doesn't start within 6 seconds, let the Booster PAC cool for 3 minutes before attempting to start the vehicle again or you may damage the Booster PAC.*
10. When the vehicle is started, disconnect the negative (–) battery clamp from the vehicle frame and return it to its holster.
11. Disconnect the positive (+) clamp and return it to it's holster.

Used as an Alternative Power Supply for Vehicles

Your Booster PAC is an essential tool for all who replace automobile batteries. Most vehicles have electronic components with memory, such as alarm systems, computers, radios, phones, etc. and when the vehicle's battery is replaced, the memory is lost. However, if the power extension cord is plugged from the Booster PAC to the 12 Volt outlet on the vehicle, the memories can be saved.

Note: *To use the Booster PAC for this purpose, the chosen outlet must be live when the vehicle is turned OFF. On some vehicles, 12 Volt outlets are deactivated when the vehicle is turned OFF.*

Used as a Multipurpose Power Supply

Your Booster PAC is also a portable power source for all 12 Vdc accessories equipped with a male 12 Volt plug. The DC outlet on the Booster PAC has automatic overload protection.

When your Booster PAC is used with a DC to AC power inverter, it can operate appliances normally powered by 120 Vac or 220 Vac. Recommended inverter for the portable power source is 300 watts maximum. For more information, contact your nearest Booster PAC dealer.

TROUBLESHOOTING

Problem: 1 or 2 red lights come on, charger is plugged in for 24 hours and there is no change in status of lights.

Answer: Check charger to see if it is charging. Charger should be warm.

Problem: Charger works well but still no change in status of lights when the wall charger is connected to the Booster PAC (yellow light is on).

Answer: Possible defective battery or faulty breaker. Try using a device (light, TV, etc.) with a 12V plug on it to see if it works. If it operates, the Booster PAC breaker is OK and the battery is the problem.

Problem: All of the lights come on when the charger is plugged into the Booster PAC, but when the charger is unplugged and the test button pressed, no lights come on.

Answer: Your Booster PAC has a defective battery which must be replaced.

Problem: The Booster PAC is fully charged but has no power.

Answer: Check where the wire meets the jaw on the Booster PAC clamp. Make sure they are well crimped.

Problem: When trying to use an accessory through the 12 Volt outlet on the Booster PAC, I heard a clicking sound coming from inside the Booster PAC.

Answer: The accessory is drawing too many amps, causing the internal circuit breaker to cycle ON and OFF. There may be a problem with the accessory (such as a short circuit) that is causing the overload condition.

QUESTIONS & ANSWERS

Question: How many jump starts can a fully charged Booster PAC perform before needing to be recharged?

Answer: 1 to 30. Factors impacting this are temperature, general condition of the vehicle being jump started, engine type and size.

Question: Can the Booster PAC's battery be replaced?

Answer: Yes, call Technical Service at (913) 310-1050 (U.S.).

Question: Can the Booster PAC be recycled?

Answer: Yes, the environment was one of our main concerns in the development and design of the Booster PAC. Most battery outlets can dispose of this product at its life's end. In fact, your Booster PAC contains a sealed, non-spillable lead acid battery and **proper disposal is required by law**. See *Battery Removal and Disposal Instructions.*

Question: What is the ideal in-use temperature of the Booster PAC?

Answer: Room temperature. The Booster PAC will also operate at below zero temperatures, however its power will be reduced. Intense heat will accelerate self discharge of the Booster PAC battery.

Question: I have a regular 10 amp battery charger, can I use it to recharge the Booster PAC?

Answer: No, only the supplied wall charger should be used.

Question: Is the Booster PAC goof proof?

Answer: No, jump starting instructions must be followed. Read and understand all safety and operating instructions in this manual and those found in the owner's manual of any vehicle being jump started before using your Booster PAC.

Question: I'm recharging my Booster PAC. Should the green CHARGE COMPLETE light immediately come on?

Answer: No. First the yellow CHARGING light will come on to indicate the charging process is beginning. Then, the red POWER LEVEL lights come on in sequence as the level of charge increases. Finally, the green CHARGE COMPLETE light will come on, but only when the Booster PAC approaches full charge.

Question: How long should I charge the Booster PAC?

Answer: It should be charged for a minimum of 30 hours when new. Your Booster PAC can be left on the wall charger continuously. When recharging with the wall charger, the Booster PAC should be charged for 4 to 6 hours per light that remains unlit when the TEST button is pressed.

Question: How do I know when the Booster PAC is fully charged?

Answer: Follow all charging instructions. Remove the Booster PAC from the wall charger and press the TEST button. If all power indicator lights come on, it is fully charged.

Question: How can I test the battery in my Booster PAC to see if it needs to be replaced?

Answer: We recommend that you use a 100 amp battery load tester. Load the Booster PAC battery for 6 seconds with a 100 amp load and it should maintain at least 9 Vdc.

TESTING THE BATTERY

After fully charging the battery so all red lights come on, apply a 100 amp load to the vehicle charging plug (on the Booster PAC), for a period of 6 seconds, while monitoring the battery voltage (at the vehicle charging plug). The battery is good if the voltage is 9.5 Vdc or higher.

BATTERY REMOVAL AND DISPOSAL INSTRUCTIONS

CONTAINS SEALED LEAD-ACID BATTERY.
BATTERY MUST BE RECYCLED.

The battery inside this product is a sealed lead-acid battery. It is **required by law** to be removed and recycled or disposed of properly. While there are federal regulations that must be complied with throughout the United States, your individual state or local governments may have additional regulations to be followed.

When the battery in this product is in need of replacement, remove it according to the instructions provided below and take it to your local recycling center for proper recycling or disposal. If you don't have a local recycling center that handles sealed lead-acid batteries, contact your local environmental agency for instructions.

Removal Instructions

Begin by making sure that both clamps are securely stowed in their holsters on each side of the Booster PAC.

1. Lay the Booster PAC down on its front. On the back of the unit, locate the four screws that hold the case together (two along the left edge and two along the right edge).
2. Remove the four screws, then lift off the back half of the case.
3. On the top of the battery are two terminals, each with wires connected to them. Disconnect these wires from the battery by removing the bolts that hold them to the battery terminals. To prevent accidental arching, be careful not to touch both battery terminals with the tools being used to remove the bolts.
4. Lift the battery out of the front half of the case.

WARRANTY

Clore Automotive warrants this product to be free from defects in material or workmanship for a period of one year from the date of original end user purchase.

This warranty extends to each person who acquires lawful ownership within one year of the original retail purchase, but is void if the product has been abused, altered, misused or improperly packaged and damaged when returned for repair.

This warranty applies to the product only and does not apply to any accessory items included with the product which are subject to wear from usage; the replacement or repair of these items shall be at the expense of the owner.

THE TERMS OF THE CLORE AUTOMOTIVE LIMITED WARRANTY CONSTITUTE THE BUYER'S SOLE AND EXCLUSIVE REMEDY. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THIS EXPRESS WARRANTY. AFTER 1 YEAR FROM DATE OF PURCHASE, ALL RISK OF LOSS FROM WHATEVER REASON SHALL BE PUT UPON THE PURCHASER.

CLORE AUTOMOTIVE SHALL NOT BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES UNDER ANY CIRCUMSTANCES: CLORE AUTOMOTIVE'S LIABILITY, IF ANY, SHALL NEVER EXCEED THE PURCHASE PRICE OF THIS MACHINE REGARDLESS OF WHETHER LIABILITY IS PREDICATED UPON BREACH OF WARRANTY (EXPRESS OR IMPLIED), NEGLIGENCE, STRICT TORT OR ANY OTHER THEORY.

Some states do not permit the limitation of warranties or limitation of consequential or incidental damages, so the above disclaimer and limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Instructions for obtaining service under this warranty:

If this product fails within the first 30 days after retail purchase due to a defect in material or workmanship, return it to your place of purchase for an exchange. From day 31 to day 365 after retail purchase, contact Clore Automotive Technical Service at the number below for warranty service. A valid, dated sales receipt is required to obtain service under this warranty.

Registering Your Purchase

For best service and to receive periodic product updates, follow the instructions below to register your purchase:

Please visit: www.cloreregistration.com
Click on the Booster PAC logo
Complete the information in the web form and click "submit"
It's that easy!

For answers to questions concerning use, out-of-warranty service, or warranty/service information on this or other Clore Automotive products, contact:

Clore Automotive Technical Service
800.328.2921
913.310.1050
www.cloreautomotive.com

BOOSTER PAC® BRAND

User's Manual

Clore Automotive • Kansas City, MO 64161 • www.cloreautomotive.com • 913.310.1050

Warning: This product contains chemicals, including lead, known to the State of California to cause cancer, birth defects and other reproductive harm. ***Wash hands after handling.***

© 2006 Clore Automotive, 6/06

842-270-020

Clore Automotive

MATERIAL SAFETY DATA SHEET
PRODUCT NAME: Sealed Lead Acid AGM Batteries
DATE: 02/22/10
ISSUED BY: Engineering

EMERGENCY TELEPHONE NUMBERS:
US: CHEMTREC 1-800-424-9300
CAN: CHEMTREC 1-800-424-9300
OUTSIDE US: +1-202-483-7616
NON-EMERGENCY: 913-310-1050

HAZARDOUS COMPONENTS

COMPONENTS	%WEIGHT	TLV	LD50 ORAL	LC50 INHALATION	LC50 CONTACT
Lead (Pb, Pb02, PbSo)	About 70%	N/A	(500) Mg/Kg	N/A	N/A
Sulfuric Acid	About 20%	1 mg/m3	(2.140) Mg/Kg	N/A	N/A
Fiberglass Separator	About 5%	N/A	N/A	N/A	N/A
Styron R 478 (Polystyrene)	About 5%	N/A	N/A	N/A	N/A

PHYSICAL DATA

COMPONENTS	DENSITY	MELTING POINT	SOLLUBILITY (H2O)	ODOR	APPEARANCE
Lead	11.34	327.4°C (Boiling)	None	None	Silver-Gray Metal
Lead Sulfate	6.2	1070°C (Boiling)	40mg/l (15°C)	None	White Powder
Lead Dioxide	9.4	290° (Boiling)	None	None	Brown Powder
Sulfuric Acid	About 1.3	About 114°C (Boiling)	100%	Acidic	Clear Colorless Liquid
Fiberglass Sep.	N/A	N/A	Slight	Toxic	White Fibrous Glass
478 Polystyrene	N/A	N/A	None	None	Solid

FLAMMABILITY DATA

COMPONENTS	FLASHPOINT	EXPLOSIVE LIMITS	COMMENTS
Lead	None	None	-
Sulfuric Acid	None	None	-
Hydrogen	N/A	4%-74.2%	Sealed batteries can emit hydrogen only when overcharged. (Floal voltage> 2.4 VPC)
Fiberglass Sep.	None	N/A	Toxic vapors may be released. In case of fire: wear self-contained breathing apparatus.
478 Polystyrene	None	N/A	Temperatures over 300°C (572°F) may release combustible gases. In case of fire: wear positive pressure self-contained breathing apparatus.

FIRST AID

SULFURIC ACID PRECAUTIONS

SKIN CONTACT: Flush with water; see physician if contact area is large or if blisters form.

EYE CONTACT: Call physician immediately and flush with water until physician arrives.

INGESTION: Call physician. If patient is conscious, flush mouth with water, have patient drink milk or sodium bicarbonate solution.

DO NOT GIVE ANYTHING TO AN UNCONSCIOUS PERSON.

REACTIVITY DATA

COMPONENT	Sulfuric Acid
STABILITY	Stable at all temperatures
POLYMERIZATION	Will not polymerize
INCOMPATIBILITY	Reactive metals, strong bases, most organic compounds
DECOMPOSITION PRODUCTS	Sulfuric dioxide, trioxide, hydrogen sulfide, hydrogen
CONDITIONS TO AVOID	Prohibit smoking, sparks, etc. from charging area. Avoid mixing acid with other chemicals.

SPILL OR LEAK PROCEDURE

STEPS TO TAKE IN CASE OF LEAKS OR SPILLS: If sulfuric acid is spilled from a battery, neutralize the acid with sodium bicarbonate (baking soda), sodium carbon (soda ash), or calcium oxide (lime). Flush the area with water discard to the sewage systems. Do not allow unneutralized acid into the sewage system.

WASTE DISPOSAL METHOD: Neutralized acid may be flushed down the sewer. Spent batteries must be treated as hazardous waste and disposed of according to local state and federal regulations. A copy of this material safety data must be supplied to any scrap dealer or secondary smelter with battery.

PROTECTION

EXPOSURE	PROTECTION	COMMENTS
Skin	Rubber gloves, Apron	Protective equipment must be worn if battery is cracked or otherwise damaged.
Respiratory	Respirator (for lead)	A respirator should be worn during reclaim operations if the TLV exceeded.
Eyes	Safety goggles, Face shield	-

ELECTRICAL SAFETY

Due to the battery's low internal resistance and high power density, high levels of short circuit can be developed across the battery terminals. Do not rest tools or cables on the battery. Use insulated tools only. Follow all installation instruction and diagrams when installing or maintaining battery systems.

HEALTH HAZARD DATA

LEAD: The toxic effects of lead are accumulative and slow to appear. It affects the kidneys, reproductive, and central nervous system. The symptoms of lead overexposure are anemia, vomiting, headache, stomach pain (lead colic), dizziness, loss of appetite, and muscle and joint pain. Exposure to lead from a battery most often occurs during lead reclaim operations through the breathing or ingestion of lead dusts and fumes. THIS DATA MUST BE PASSED TO ANY SCRAP OR SMELTER WHEN A BATTERY IS RESOLD.

SULFURIC ACID: Sulfuric acid is a strong corrosive. Contact with acid can cause severe burns on the skin and in the eyes. Ingestion of sulfuric acid will cause GI tract burns. Acid can be release if the battery case is damaged or if the vents are tampered with.

FIBERGLASS SEPARATOR: Fibrous glass is an irritant of the upper respiratory tract, skin and eyes. For exposure up to 10F/CC use MSA Comfoll with type H filter. Above 10F/CC up to 50F/CC use Ultra-Twin with type H filter. This product is not considered carcinogenic by NTP or OSHA.

I.A.T.A. UN2800 CLASSIFICATION

We hereby certify that all ES Series and Clore Proformer Rechargeable Lead-acid Batteries conform to the UN2800 classification as "Batteries, Wet, Non-Spillable, and Electric Storage" as a result of passing the Vibration and Pressure Differential Test described in D.O.T., 49 CFR 173.159(d), and IMO/IMDG, and ICAO/IATA packing instruction 806 and note A67.

ES Series and Clore Proformer Batteries, having met the related conditions, are EXEMPT from hazardous goods regulations for the purpose of transportation by DOT, and IATA/ICAO, and therefore are unrestricted for transportation by any means. For all modes of transportation, each battery outer package is labeled "NON-SPILLABLE." All our batteries are marked non-spillable.

Notes

NOTES:

American Augers, Inc.
135 US Route 42
P.O. Box 814
West Salem, Ohio 44287
www.americanaugers.com
TEL: 419-869-7107 • FAX: 491-869-7425
800-324-4930

Due to our continuing product improvement, machine specifications are subject to change without notice.

Original Instructions
Manual Part Number 6ER30000
Released April 2012 Revision 04